Proceedings of the

American Association of Textile Chemists and Colorists

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December 15, 1958

Piedmont Section———

SYMPOSIUM ON WASH-AND-WEAR*

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A Brief Look at Wash-Wear Finishing

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INTRODUCTION

THE purpose of this discussion is to summarize briefly the present status of wash-wear finishing.

At the outset it might be well to consider what is meant by the term wash-wear. I am quite sure that most persons expect that a garment treated with a wash-wear finish will have two characteristics: 1) on washing, the garment will dry relatively free of wrinkles, and so require little or no ironing; and 2) on wearing, the garment will resist mussing, and those wrinkles that do form will quickly hang out.

We might say, then, that such a fabric must have good wet crease recovery and good dry crease recovery. However, I am not certain that the situation is quite that simple. Consider the following:

1) Dry crease recovery seems to correlate fairly well with muss resistance in end use.
2) Yet the correlation is not a perfect one, because two treatments having equal crease recovery will not necessarily have equal muss resistance under conditions of actual wear.
3) Similarly, wet crease recovery usually correlates in a general way with wrinkle-free drip drying.
4) But for wrinkle-free tumble drying, it appears that the fabric must have both good wet and good dry crease recovery.
5) Here again the situation is complex, because it is possible to find cases where two fabrics have equal dry recovery and unequal wet recovery, with the better tumble drying performance being obtained from the fabric having the *poorer* wet recovery.
6) It might be conjectured that a complete understanding of tumble drying performance would require a knowledge of the thermal properties of the finish; that is, a measure of hot-wet and hot-dry crease recovery.

As a further generalization, we can state that a cotton fabric having good dry crease recovery will have at least fairly good wet recovery. But the opposite is not true, as has recently been demonstrated in the case of a wet-crosslinking treatment which produces good wet crease recovery but no increase in dry recovery. The resulting fabrics may be successfully drip dried, but not tumble dried; and they wrinkle badly in end use.

The present discussion will be limited to treatments having both wet and dry recovery in end use.

Because of the complexities of the situation, wash-wear properties are best measured by washing and drying tests, using garments or simulated garments and actual consumer equipment. It is interesting to note that, in most cases, tumble drying gives the best results; this is particularly true in the case of rayon. Drip dry-

*Presented before the Piedmont Section at the Hotel Charlotte, Charlotte, NC, on September 20, 1958

ing (soaking wet) gives a somewhat poorer result. Worst of all, for most finishes, is the practice of spinning (that is, centrifuging) followed by drying on a line.

THE FABRIC

A few generalizations may be made concerning the preferred type of fabric. For example, a loose weave is more amenable than a tight weave. An oxford usually gives better results than a broadcloth. Yet to some extent such considerations are academic, because there is always the marked tendency to utilize traditional fabrics, of the traditional count and weight.

It would be unfair to say that no concessions have been made. In the case of broadcloth, for example, the popular 136/60 construction was found to be rather weak after wash-wear finishing. A 136/72 was tried, but this was too tight a weave to give satisfactory results. A 136/64 was then tried, in some cases using heavier yarns, and found to be a good compromise.

Regardless of its construction, the fabric must be properly prepared for finishing. It must be free of natural impurities, warp sizing, and other extraneous materials. Moreover, as was pointed out a few years ago, the fabric must be low in alkalinity, otherwise catalysis of the resin may be interfered with. Improper fabric preparation will result in poor wash-wear properties, inadequate durability, and/or poor chlorine resistance.

Mercerization as a preparatory step is regarded by most authorities as being beneficial, although the effect is not pronounced. The benefit may be greater in the case of wet crease recovery than of dry recovery; published data are scanty. Here again, the question is more or less academic, as most shirting fabrics, at least, are mercerized for better luster, regardless of any effect on wash-wear.

In the case of rayon, German publications (and I believe a few British publications as well) have stressed a precausticizing operation, such as 5% NaOH or 10% KOH, as a preliminary treatment to improve wet crease recovery. I have not had sufficient experience with this to say that it has any appreciable effect, but pass the information along to you for your consideration.

CREASEPROOFING AGENTS

The primary finishing agents—the components providing the bulk of the wet and dry crease recovery—are many and varied. They fall into two natural classes, nitrogenous and nonnitrogenous. The main properties of the commonly used types are outlined below.

NITROGENOUS TYPES——

Urea formaldehyde. This has long been employed for crease-resistant rayon suiting, but little used on cotton because of poor chlorine resistance as well as poor durability. However, during the past year a well-known line of imported wash-wear shirts has been finished with a urea resin; I believe they were marked "do not use chlorine".

It might be noted that chlorine bleach will ordinarily not damage such a fabric if used at the recommended concentration, even if the fabric is subsequently "touched up" with an iron; but it will tend to remove the finish.

In any consideration of urea resins, it must be remembered that rather wide variation in results can be obtained depending on the formaldehyde-to-urea ratio.

Melamine formaldehyde. This is more durable than the corresponding urea type. The chief defect is a tendency to yellow when chlorine bleached. The degree of yellowing will vary considerably depending on the exact composition—the more highly methoxymethylated, the less yellowing. With $MgCl_2$ or $Zn(NO_3)_2$ catalyst, certain melamine types will not yellow on chlorination at room temperature. However, most straight melamine types will yellow to some extent if hot chlorinated.

By mixture with, or coreaction with, other materials, a melamine can be made reasonably nonyellowing; and at least one product offered for wash-wear finishing contains an appreciable proportion of melamine.

Ethyleneurea formaldehyde. This is similar to urea formaldehyde in some ways, but quite different in others. Two major advantages are lower chlorine retention and greater durability. The durability to alkaline washing rivals that of the melamine type. However, acid souring (as in commercial laundering) tends to remove it more readily. An advantage over melamine is that it never yellows in the chlorination bath. Unfortunately, an ethyleneurea finish is marginal in chlorine resistance on cotton, and I should like to digress for a moment to explain precisely what I mean by marginal.

The best EUF finish I know is that obtainable with zinc nitrate catalyst and a hard cure. Such a finish will withstand repeated home chlorinations and also commercial laundering as prescribed by the American Institute of Laundering. But when shirts are made up from such fabric and sent out to various commercial laundries, it will be found that a few laundries will manage to damage the shirts in five or 10 washings. It is obvious that not all laundries follow AIL procedure. Deviation may occur in concentration of chlorine, pH of the sour, and other important ways.

I might add that shirts are more susceptible to damage than is flatwear. The difference is apparently in the pressing. A shirt will often show weakening and damage just below the collar, where the fabric is double pressed. That is, the body of the shirt is pressed, then the collar is pressed, so that the area just below the collar gets two pressings.

As a result, while an EUF/zinc nitrate finish is quite chlorine-resistant, it may be damaged by the more severe commercial laundering procedures. That is why I say that such a finish is marginal.

Actually, when you send such a fabric to a commercial laundry, you are not testing the finish, you are testing the laundry.

Triazone formaldehyde. Because some laundry procedures are severe, a resin has been designed which has a greater "safety factor' built into it. This is the so-called triazone. The triazone type retains a little chlorine, like the EUF type or usually a little bit more, but due to its greater buffering power it does not damage even under the severe conditions of accelerated laboratory testing (such as five full Sanforized washes followed by AATCC Tentative Test 69-1952). Moreover, it has greater resistance to removal by acid souring than does the EUF type; and does not yellow on chlorination, as does the MF type. Because of these advantages, triazone resins are being used on several lines of white wash-wear shirts.

There are two difficulties—the tendency to yellow on ironing (with or without bleach) and the tendency to produce fish odor, a matter that will be referred to later on.

NONNITROGENOUS TYPES——

Formaldehyde. This has been used as a major ingredient in a rayon stabilization finish, but for wash-wear cotton it has two disadvantages—ex-

cessive strength loss, and poor crease resistance from a subjective standpoint (that is, it does not feel crease-proof despite fairly high recovery angles).

There are a number of other non-nitrogenous reactants. Two commercially available types are:

The Acetals, which are made by reaction of formaldehyde with polyalcohols.

The Diepoxy types, which have no formaldehyde in their make-up.

Used alone, these show the same deficiencies as formaldehyde, though not to the same extent (ie, the crease recovery/strength ratio is somewhat poorer than that of nitrogenous types). Accordingly, they are for the most part used in conjunction with nitrogenous resins. In some cases the nitrogenous material is incorporated by the manufacturer; in other cases the ingredients are mixed by the finisher at the time of use.

In the resulting blends, the nonnitrogenous component adds greater durability and greater chlorine resistance, with sometimes a very slight reduction in either crease recovery or strength.

A 7:3 (solids ratio) of epoxy and EUF types has been recommended as a wash-wear shirting finish.

EFFECT ON FABRIC PROPERTIES

The most important change in fabric properties is enhanced crease recovery, both wet and dry. This is why the treatment is applied. Other desirable effects are shrinkage control, quicker drying, resistance to rotting.

Along with the desirable effects, however, there are a number of undesirable ones. Chief among them are reductions in tensile strength, tear strength, and abrasion resistance. This is a complicated subject about which much has been written and I shall not take time to discuss it here. However, it might be worth noting that the commercial application of resin finishes to cotton was delayed many years because of a reluctance to accept the strength losses which always accompany resin treatment. Now that strength loss has been accepted, we face the danger that we may go too far in that direction.

Two other perennial problems, resulting specifically from treatment with nitrogenous resins, are chlorine retention and fish odor. To summarize briefly, chlorine retention shows up differently with different resins: in the case of the UF, as scorching and strength loss. With the MF, primarily as yellowing on chlorination. With the EUF, if it shows up at all, as strength loss. With the TF, it usually does not show up; but the tendency to yellow on ironing may be made worse by bleach.

Tendency to produce fish odor also varies with resin type. As this is the subject of a paper to be published soon in *Textile Research Journal,* I shall not say much about it. However, as mentioned earlier, the possibility of fish odor formation is very pronounced in the case of the TF resin, and very thorough afterwashing is necessary to avoid it. By contrast, a properly formulated EUF finish is practically immune to fish odor, even though it is not afterwashed.

It is evident that each of the available resins and reactants has its own specific advantages and peculiarities. You pay your money and take your choice.

One other problem is soil pickup; but this is usually the result of additives to the resin finish and not the resin itself. Let us consider briefly what some of these additives might be.

ADJUNCTS TO THE WASH-WEAR FINISH

Aside from the resin or reactant, the following materials may be present:

Catalyst: ammonium salt types are just about obsolete. Amine hydrochlorides are widely used. Metal salts have recently become very popular: magnesium chloride is a very mild catalyst; large amounts may be used with little danger of fabric embrittlement. Zinc nitrate is a stronger catalyst, and must be used with caution; but better durability and chlorine resistance can be achieved through its use. Zinc fluoborate is an even stronger catalyst; its use is restricted largely to the epoxy and epoxy-blend finishes.

Softener: for hand, greater tear strength, better sewability. (For use with triazone finishes, which are severely afterwashed, the fabric should preferably be after-softened, or softened in the last rinse).

Water-soluble polymer (such as polyvinyl alcohol, modified starch, or precondensed thermoset): for greater body, slight crispness. Better wet crease recovery in the case of rayon.

Soft Thermoplastic: for improved dry crease recovery/tear strength ratio; durable soft, full hand; better abrasion resistance.

Silicone: for durable softness, resistance to water-borne stains. Also added along with thermoplastic resin to prevent sticking to equipment.

By proper selection of resin or reactant, catalyst, and other adjuncts, it is possible to obtain a finish having good wet and dry crease recovery, satisfactory strength, chlorine resistance, and freedom from fish odor. Naturally, the balance between these properties will vary somewhat depending on the exact formulation employed. The decision as to what is the "best" formulation will depend, therefore, on the relative importance assigned to the various end use characteristics.

Returning now to soil pickup: it has been claimed that finishes containing soft thermoplasts and/or silicones will pick up dirt from wash liquor. This may, in certain instances, be true. However, I should like to stress an important fact that has thus far been overlooked: soil pickup is ofttimes as much a function of type of soil as of the type of finish. In an unpublished study, we have found that as the type of soil is varied, not only does the degree of soiling vary, but also there are marked reversals in soiling tendency. Accordingly, no far-reaching conclusions should be drawn from a single laboratory test using one particular soil type.

OTHER VARIABLES

Rayon differs considerably from cotton in its response to wash-wear treatment. Not only are higher resin or reactant solids required to obtain equal dry recovery, but when dry recovery has been achieved, wet recovery may still be very low. This can most satisfactorily be improved by addition of a small amount of precondensed thermosetting resin to the formulation. A further problem is low abrasion resistance, for which no completely satisfactory solution has been reached.

A few processing variables might also be mentioned. Calendering or Sanforized calendering prior to curing has been recommended for wash-wear rayon, and has also been used to some extent for cotton. Calendering *after* curing is also done in some instances; this gives a smoother hand but it is doubtful whether any improvement in wash-wear properties results.

Discussion of Wash-and-Wear or Easy-Care Testing Methods and Standards

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Greensboro, N C

IT appears that everyone associated with the textile industry is still demanding, clamoring for and shouting for uniform, trade-accepted test methods for evaluating performance of wash-and-wear or easy-care garments and household items.

This request is still being made in spite of the fact that there have been numerous meetings with attendant expounding of wisdom from various panels on wash-and-wear with the result that all phases of the industry have proposed their definitions, test methods, evaluation technique and standards, and I am sure each feels that theirs is more correct than all others.

This ubiquitous interest in wash-and-wear by all segments of the industry to give the consumer a satisfactory garment or product is as it should be. We all have a stake in the development of the best possible performance of items or garments in consumer use.

The full cooperation of the entire industry will result in even greater acceptance of wash-and-wear by the housewife, who is truly appreciative of wash-and-wear garments and household items, which have eased her burden with respect to either eliminating or substantially cutting down the time of the tedious task of back-breaking ironing after laundering. As you no doubt have heard, our womenfolk are much more realistic with respect to wash-and-wear than is the industry. They have looked over our wash-and-wear fabrics and garments made of same and like them very much. Their attitude towards wash-and-wear is . . . "Wash-and-Wear garments are so easy to iron". They expect to touch-up their garments for better appearance and are happy that their ironing has either been eliminated or reduced by about 500%, or from 30 minutes full ironing to five minutes touch-up per garment, with the touched-up garment invariably having a better finished appearance than the prior garment not made of wash-and-wear fabric, which requires dampening before the long and laborious ironing. Most of you remember, and in fact still see in your home, the practice of dampening a conventional (ie, not wash-and-wear) garment before ironing, not only because a smooth finish is desired but in some instances because fabric has been shrunk and needs restoration in ironing. The resultant ironing of the dampened garment may take 20 or 30 minutes, while the laundered and dried wash-and-wear garment, which does not need dampening or restoration, can be touched-up or ironed to as good or better smooth, wrinkle-free appearance in a few minutes by ironing the dry fabric with a dry hand-iron or by hand steam-iron pressing.

Yet, with all these proposed wash-and-wear test methods available, each of which may have merit for the particular end-use it was established to evaluate, none have as yet been accepted by the industry as the acceptable overall method for a standard wash-and-wear test and performance-evaluation procedure. This is probably due to the many levels of wash-and-wear or easy-care end uses involved. Each, however, can be properly evaluated and rated through agreed-upon standards for each end use, if the proper vehicle is supplied for testing and evaluation. This has not been realized as yet because most proposed test methods have been lacking in overall coverage.

Most test methods published have been very similar in service requirements, sample preparation, laundry procedure, and drying directions, but have not agreed upon a uniform method of evaluation. The acceptance or rejection of a fabric or garment in most laboratories is normally based on the human element, in that the rating is based on the judgment of one, or a panel of three or 10 laboratory personnel of that particular laboratory, and it could be either superior or inferior to the average understanding and not duplicable at any other laboratory because the class rating of 1 (poor) to 5 (excellent) will vary with each laboratory. I have been amazed that no one appears to question the authority of any such claimed class rating. It appears that all anyone has to do is to claim that his fabric meets either a Class 3, 4 or 5 rating for him to gain complete acceptance without the user knowing what these ratings represent. I have seen some garments, which I wouldn't wear to a cock fight, rated excellent by a laboratory of good repute, but then maybe the garment was wrinkled while in transit in the mail, the panel may have rushed its evaluation because it was quitting time, the panel may have been tired that day and couldn't see the wrinkling, or some other good reason. Any of these excuses may be acceptable, but it still doesn't result in uniform interlaboratorywise evaluation.

I was suprised to hear, at a recent meeting of the AATCC Wash and Wear Committee in Philadelphia, that garments cannot be evaluated to AATCC photographic standards because these photographs are to be used only for evaluating surface wrinkling of fabrics. This is rather disconcerting as I've always felt that evaluation of a fabric either in swatch or garment can be made with the same photographic standard. Different evaluation standards for a swatch of fabric and a fabric in garment could lead to a lot of confusion.

Everyone here is familiar with the Standard Spray Test ratings (AATCC Standard Test Method 22-1952), and how anyone, after an explanation or just reading of test procedure and evaluation and reference to the photographic spray rating chart, can readily evaluate a Spray Rating as 100, 90, 80, 70, 50 or 0. It is applicable either to fabric swatches or fabric in garments. That is exactly what we need for the evaluation of wrinkling and pressed crease or pleat retention: photographic standards by which the same class rating will be given fabric or garment whether rated by one person or a hundred persons, in Charlotte, New York, or in London.

You may want to point out that the industry has such photographic standards and cite those of AATCC, E I du Pont de Nemours & Co, Inc, and those developed by Eastman

Chemical Products, Inc. And you may already have made certain conclusions on each. I would like to give my impressions of them.

1) They all are a step in the right direction and are more reproducible interlaboratorywise than the judgment of a panel of any three or more people in any one laboratory.
2) AATCC photographic standards may not be acceptable because of the following.
   a) They cover evaluation of fabric in swatches but not in garments.
   b) They give the wrong impression to the average layman, in that Class 5, the best photograph, shows a lot of wrinkling. The consumer and many technicians seeing this as a standard "wouldn't have any". It would be useless to try to explain that the fabric photographed does not show these wrinkles when examined under normal lighting and that the only way one could see these wrinkles in fabric would be under special lighting, which overamplifies the wrinkles. This is a good research tool, but most technicians, salesmen, and buyers want to be able to rate fabrics by normal lighting and be able at a glance to judge whether a garment, fabric or item is satisfactory in appearance or not.
   c) These standards are drawn up to evaluate surface wrinkling only, and no provision is made for evaluating pressed crease or pleat retention.
3) Du Pont photographs have merit but are not actual size. This, we feel, may diminish their value in evaluation, in the matter of actual comparison. These photographs look better, ie, less wrinkled than the original fabric photographed, because reduction of the photographs to fit the folder resulted in a muting of the wrinkles.

   The photographs in Du Pont's Multi-Fiber Bulletin X-83 of March, 1958, are so wrinkle-free that their worst could be rated "wash-and-wear; slight touch-up needed", and thus their photographic standards do not cover the "easy care" category into which a vast amount of fabrics will fall. These photographic standards also are drawn up to evaluate surface wrinkling only and have no photographic standards to evaluate pressed crease or pleat retention.
4) Eastman Chemical Products, Inc has done a marvelous photographic job and these photographs are very realistic. Washed fabrics may be compared with them directly after washing and drying to determine the degree of wrinkling or pressed crease retention, a plus the other photographic standards do not have. I understand that the AATCC Committee is examining same for study and possible use as evaluation standards for both fabrics and garments, but this is only hearsay and may not be correct. We at Burlington and other firms who have received a set of these photographs are using them for assigning class ratings to washed fabrics and garments to grade degree of wrinkling and pressed crease retention if necessary, and we certainly recommend that they be examined by the industry as the possible evaluation standards by which ratings can be assigned each end-use.

Eastman Chemical, Du Pont, and Monsanto Chemical Co, the developer of AATCC standards, will gladly supply their photographic standards to anyone on request.

You may have other impressions of these standards and everyone is entitled to his opinion, but if you haven't examined and rated washed fabrics to at least one of these photographic standards, which are definitely a step in the right direction, this reference to same may make those of you who are especially interested investigate all three. For the convenience of the members present, I have brought a set of each for examination.

In the above, I have been somewhat critical of some of the existing evaluations being used. I thought it might be of interest to you to describe what my company does in its screening of wash-and-wear fabrics. At least it may stir up some points of dissension, which may be a good thing.

Burlington Industries Laboratory was among the first to draw up test methods and standards, which, even in 1954, were very similar to the various test methods now used by the industry. These included drip drying and tumble drying at 140 as well as 110°F laundering, and even then we used the ratings of no ironing needed, slight touch-up needed, and the minimum or easy-to-iron category.

Our definition of wash-and-wear or easy-care has not changed in that we still feel there are these categories into which fabrics fall:

1) *Wash and Wear—No Ironing Needed.* Fabrics falling into this category will, in addition to the service requirements of their end use, be characterized by wearable appearance when washed and dried by standard methods *without ironing.*
2) *Wash and Wear—Slight Touch-up Needed.* Fabrics falling into this category will, in addition to the service requirements of their end use, be characterized by wearable appearance when washed and dried by standard methods followed only by *slight touch-up.*
3) *Easy Care—Needs Only Minimum Ironing.* Fabrics falling into this category should not be called wash-and-wear, but easy care or minimum care, which implies that dry fabric or garment will need dry ironing. Fabrics in this classification will, in addition to service requirements of their end use, be characterized by wearable appearance with respect to wrinkling and pressed-crease retention when washed and dried by standard methods after dry ironing.

In referring to service requirements, we mean that, in addition to meeting wash-and-wear or easy-care requirements, the fabric strength, colorfastness, durability, sewability, dimensional stability to laundering, and other service requirements meet trade acceptance standards.

Burlington conducts separate tests for screening of wash-and-wear and wear testing of garments, although the wash-and-wear parts of the tests are identical, insofar as washing, drying and evaluation are concerned.

We, as fabric developers and manufacturers of fabrics, are interested initially in a wash-and-wear test that will result in the screening of fabrics with respect to whether they do or do not have wash-and-wear or easy-care potential plus the usual service requirements of the end use. Those showing wash-and-wear potential and merchantable sales appeal are then made up into garments and wear tested. Our garment wear tests not only report whether garments do or do not meet wash-and-wear requirements, such as wrinkling and pressed-crease retention after wear and laundering, but also take into account

about 17 other points after at least five cycles of wear, each of which consists of four wearings and one laundering.

These garment wear tests probably are not made by all fabric manufacturers or converters, but they definitely should be made by the garment manufacturer on all potential wash-and-wear or easy-care fabrics which pass screening tests, as at this point the fabric manufacturer or converter has tested the fabric and delivered a material showing promise and should be able to advise the garment manufacturer as to the best washing and drying procedure, what wash-and-wear or easy-care category his screening tests have indicated they fall into, and whether touch-up or ironing is needed.

Preliminary wear tests on garments by the garment manufacturer will show whether his cutting, tailoring, styling, selection of interlining, lining, shoulder pads, and sewing thread are compatible; and whether his sewing machine working order, sewing machine operator handling and pressing technique have resulted in the fabric's initially meeting screening tests and reacting similarly in garments or household items; or whether some adjustment in some step of garment manufacture must be made. There is no doubt that the garment manufacturer has one of the more important assignments in making a wash-and-wear or easy-care fabric a truly wash-and-wear or easy-care garment or household item.

The fact is, however, that many times, even when a garment's or item's performance is found to be satisfactory under laboratory washing and evaluation, it may not perform satisfactorily in the home. This may be due either to lack of proper handling by the consumer in washing and drying, even though properly advised by sewn-in label, or else the ignoring by the consumer of such washing and drying instructions. So you can see that it is important not only that each garment is labeled with proper care instructions with respect to laundering, drying, and touch-up if necessary, but that the consumer follow them to get maximum performance.

Initially, when wash-and-wear standards were first introduced about four years ago, our customers demanded that wash-and-wear fabrics withstand high-temperature washings. Until recently most Burlington Industries test methods have specified that fabrics meet either no-ironing, slight touch-up, or minimun-ironing-needed ratings with respect to surface wrinkling and pressed crease retention after three launderings at 140°F temperatures and specified drying on all end-uses. We, however, agree with the industry that fabrics made of synthetic fibers or synthetic fiber with any other fiber blends should be washed at 100°F for maximum performance with respect to least wrinkling, best pressed-crease retention, adequate soil removal, least soil redeposition and least danger of dye bleeding; and recently we have also lowered our wash temperature to 100°F unless customer specifies otherwise.

Wash-and-wear or easy-care and laundering at 100°F temperature should be made synonomous when we talk about either. Adoption of one standard wash-and-wear temperature would eliminate the present confusion in the industry and firmly establish the warm water setting in the consumer's mind as the temperature at which such merchandise should be washed. Washing at higher temperature by the consumer would be like taking more medicine than is safe, feeling that if one pill would cure, two would cure twice as fast, when in reality two pills might kill. Similarly, excessive wash temperature could ruin or at the least degrade the performance of the fabric.

However, I do feel that, even though wash-and-wear and easy-care fabric appearance and pressed-crease retention or pleat retention evaluation should be made at 100°F, fabric dimensional stability and colorfastness should be satisfactory at 120°F laundering to guard against the possibility that the fabric might be washed at a higher temperature in the home or commercial laundry even though proper low-temperature washing instructions were furnished on the sewn-in label.

The 100°F wash temperature will normally give better wash-and-wear performance with any fiber. However, natural fibers such as cotton or linen, because of special characteristics such as soil removal, may require the higher 140°F laundering temperature such as drawn up by AATCC for cottons.

Burlington Industries wash-and-wear test methods, evaluation and standards are slightly different from the many others that have been discussed to-date, with the main diferences being as follows:

1) In our definitions, "wash and wear" applies only to fabrics which, after specified washing and drying, meet either a "no ironing" or "slight touch-up needed" rating.
2) That "easy care" applies only to fabrics which, after specified washing and drying, "need only minimum ironing or pressing."
3) We use only three basic washing procedures, which are:
   a) Machine washable—drip dried
   b) Machine washable—tumble dried
   c) Machine washable—line dried.

   You will note that a "hand washable" spec is not included as we feel that all wash-and-wear fabrics should be able to withstand machine washing. Of course, a machine-washable fabric could be washed by hand and drip dried with precautions being used to avoid twisting or wringing of the garment in laundering or rinsing.
4) In sample preparation, we, in addition to swatch testing, also test the fabric by pleating if it is for such an end-use, and we make pant legs if the fabric end-use is slacks or suits.
5) We wash swatches or garments a total of three instead of five times. Considerable testing at the lab showed us that WNW rating was approximately the same after three or five launderings. We are satisfied that three launderings will give us the proper evaluation as well as faster test results, which is very important to a finishing-plant lab.
6) We use a tumbler-type washing machine for our tests as we feel that fabrics meeting surface appearance standards in this machine will give a satisfactory overall appearance with respect to wrinkling in any household washer.
7) Wrinkling and pressed-crease retention of swatches or garments are evaluated under standard lighting conditions developed by Du Pont and to eight photographic wash - and - wear standards developed by Eastman Chemical for rating degree of surface wrinkling as well as pressed-crease retention.
8) We take into consideration in the evaluation of the washed fabric or garment how much wrinkling is noted not only after three washings and specified dryings but also after touch-up or ironing; in addition, we in-

(Concluded on page P894)

"I Want to Return It Because . . . "*

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I want to return it because I can't seem to remove the soil and stains.

I want to return it because it turned yellow after a few washings.

I want to return it because it seems to be made of two different fabrics.

I want to return it because it tore the first time I wore it.

I want to return it because it doesn't wear.

I want to return it because it has a bad odor.

I want to return it because the hang tag claimed it needed "no ironing". but look at it!

These, among others, are the reasons given by customers when returning wash-and-wear merchandise. To obtain customer's letters from our stores is rather difficult. Very few returned garments actually find their way back to our laboratories because our mail order plants and retail stores generally handle their own customer returns and complaints. In mail order, particularly, the personal contact with the customer is missing. I did manage to obtain several garments and letters to illustrate our problems. We welcome the customer who takes the time to write us a letter explaining why she is returning an article rather than taking the easy way out by saying . . . "It is unsatisfactory".

To obtain my information, I inspected returned merchandise in a mail order plant, talked with our Chicago departments, with average consumers, and with other home economists who meet homemakers in their daily work. In order to supplement these facts, I also wrote to equipment manufacturers, home service directors, and equipment editors of magazines. The response was wonderful and their opinions of wash-and-wear were almost unanimous.

Actual returns do not show that our customers are dissatisfied with wash-and-wear merchandise. However. the individual consumer's opinion is not nearly as glowing. It leads me to wonder whether customers are really satisfied with wash-and-wear or whether they are accepting it and the advertising with a "grain of salt".

Briefly, we will cover complaints due to soil retention, chlorine retention, odor, fabrication and advertising. First, though, let's talk about those complaints on piece goods.

PIECE GOODS———Several consumers complained that creases put in fabrics during the finishing processes do not come out by pressing, washing or other treatment. A fabric with unwanted creases does not make an attractive garment. Another complaint is that the fabrics are off grain. All pattern guides instruct the home sewer to straighten the grain of her fabric before cutting out the garment. But home sewers find it impossible to straighten a fabric with a resin finish. Previous to resin-treated fabrics, a home sewer could pull and adjust a fabric that was off grain so that it was satisfactory for use. Now, if a fabric is off grain in the final finishing, it cannot be straightened. Therefore, a consumer may face making a decision between having prints or plaids that are off grain, or having a garment cut on the grain with a mismatched design.

To add to these woes. the home sewer says it is difficult to make bound buttonholes; seams cannot be pressed flat, even with a steam iron; and the machine needle becomes dull more quickly.

She tells us too, that treated cotton fabric is rather stiff and the garment feels uncomfortable. The dress is very hot, particularly during the summer.

SOIL RETENTION———"I want to return it because I can't remove soil!"

Consumers feel that soil retention is a problem peculiar to these fabrics. One says . . . "It is difficult to remove grease stains." "Perspiration stains are more evident and cannot be removed." Another expresses it in a slightly different manner . . . "Ground-in dirt or really dirty dirt cannot be removed." Stains are more evident on collars and across the shoulders of dresses or blouses.

A consumer in Richmond, Va returned a man's dress shirt because it had turned grey after having been sent to the laundry. The shirt was plainly labeled "Wash and Wear" and most laundries are familiar with the proper methods for handling such merchandise. It is possible the garment was laundered at home with some colored or heavily soiled garments before its trip to the laundry. However, this garment could not be returned to its original whiteness.

CHLORINE RETENTION———"I want to return it because it turned yellow!"

What can you tell a customer who has returned a yellowed uniform, blouse or shirt that was once white? Let's face it———many customers do not read labels or hang tags and many more garments do not have them! Of course, we here are familiar with the cause of the yellowed garment———the use of chlorine bleach in laundering. One consumer with two children complains that she can't use chlorine bleach on the wash-and-wear merchandise. She doesn't keep any other in the house for two reasons: 1) friends have told her the other bleaches are not effective, and 2) she doesn't like to have so many supplies to store. She finds it necessary to use chlorine bleach because of soil and stains on her children's clothes.

It is usually difficult for the customer to separate the "don't bleach" items from the others, because, if any indication is given on the item about this property, it is only on a hang tag, which is thrown away when the garment is put on the first time. Therefore, all garments get bleached and some become yellow as a result.

Another woman indicated she generally likes all-cotton or cotton blends for men's white shirts, except that they yellow quickly and she wonders just how much she dares bleach them. One other consumer had an unpleasant experience with yellowing of two white garments and says she has bought no more wash-and-wear. This white Dacron/cotton uniform shows this color change as a result of only one washing using water at 140° F and the amount of bleach as recommended on the bottle. Several uniforms of this type were returned.

A consumer from Springfield, Mass wrote:

"About three months ago, I pur-

chased a white blouse, described as 'drip-dry, washable cotton batiste detailed with eyelet embroidery'. From the description I assumed it was just as stated, an all-cotton blouse that would require little or no ironing.

"In the first washing I proceeded as I usually do with drip-dry garments. I hand washed it and hung it dripping wet on a wooden hanger. When it had dried, I realized that the blouse was made of two different fabrics———the eyelet sleeves were of a no-iron material, but the rest of the blouse, including the sleeve bands, were of an ordinary batiste with no 'drip-dry' qualities whatsoever. The batiste portion was wrinkled and needed thorough pressing. However, I did like the style of the blouse, so I did not return it.

"As I continued to wear and launder the blouse I noticed that the evelet sleeves were beginning to yellow slightly. I also happened to stain one of the sleeves with grease. So still thinking that the blouse was entirely cotton I soaked it in a bleach solution (following exactly the directions on the bleach label). The batiste portion of the blouse became sparkling white, while the sleeves emerged a bright pastel yellow. Obviously the blouse is now completely unwearable."

As you can see, this letter points out not only the chlorine-retention problem, but also one of fabrication. An interesting sidelight, too, is that the customer was willing to accept the wrinkled appearance of the garment with no complaint, but she did complain when it started to yellow.

In our contacts with finishers, fabricators and even our own buyers, we hear the comment: "This is an isolated case, not many people bleach their laundry." To show you how misleading is this opinion, I would like to quote some figures from a recent market survey. Of the total population, 83% use bleach on white clothes. 7% do not use bleach and 10% do not do white laundry. Of those doing their own laundry, 92% use bleach on white clothes. Even 27% bleach colored clothes; 17% bleach fine fabrics washed by hand and 12% bleach those washed by machine. Of the total who wash white clothes, 53% claim to bleach every load.

Based on these figures, bleaching is not an uncommon practice, but a very common one. It is a factor which should be recognized when developing and improving the finishes used to impart wash-and-wear qualities to fabrics. Much progress has been made recently in producing nonchlorine-retentive finishes, yet there is room for greater improvement.

ODOR———"I want to return it because of a bad odor!"

Have any of you unpacked a large box of garments and been overwhelmed with a disagreeable odor? I'm sure if you had unpacked a box containing eight or 10 dozen garments that smelled like this or this, you would realize that something was wrong. Many customers don't need to unwrap eight or 10 dozen ———all they need is one garment and back it comes! A high percentage of resin-finished garments have this disagreeable formaldehyde odor. Can't that be overcome? I know bad odor was a problem when the resin finishes were first used, but I thought it had been conquered. However, it has reappeared and needs to be considered a problem once more. If you would like to see just how bad some fabrics can be, won't you come up after the program and smell these?

WEARING QUALITIES———This is an actual garment returned by a customer, who says "it tore the first time I put it on." Poor tearing and breaking strengths, poor abrasion resistance are often the result of resin finishes. Wear is seen at pockets, collars, cuffs and center-front edges on garments. Customers are not satisfied when their garments tear or wear out too quickly.

FABRICATION ——— Although fabrication may not be the direct concern of members of this group, a garment which is poorly constructed can influence the consumer's acceptance of wash-and-wear merchandise.

Some consumers feel that men's suits are inclined to pucker along the seams and do not present a well-tailored appearance because of this fact. There are even some persons who feel that these summer suits still look like pajamas.

One consumer told me she returned a brand name shirt because she was dissatisfied with its appearance. The material hung fairly creaseless, but the stitching was such that every seam wrinkled and she could not press the seams smooth, even after repeated attempts. The collar and pockets looked so bad that she did not want her husband to wear the shirt.

Here is a letter written by a dentist giving his opinion on some drip dry shirts.

"Around Christmas 1956, I bought one of many shirts of the same brand. The shirt was washed once a week for 16 months. The material still looks fine. It wears like iron, but the thread is all rotten by now. The shirt is literally falling apart at the seams and requires constant mending. Wouldn't it be possible to use nylon thread or some other more durable substance to sew the shirt together? This shirt is a 65% Dacron and 35% Egyptian cotton.

"Another shirt I bought at Christmas, 1957 has also been washed once a week for four months. This shirt was supposed to be of better quality than the first shirt. The shirt cuffs have all frayed out. It looks like it has been used many years. The collar is fine as well as the thread and the rest of the shirt. I have had the sleeves cut off and made into a short sleeved shirt for the summer. I was much disappointed with this shirt as I feel I got poor service from it. The label reads, 'Imported English Fabric, Sanforized.'

"I also have five other drip-dry shirts which were bought between Christmas 1956 through Christmas, 1957. These have been wearing just fine. None of the shirts have ever been washed by using bleach or starch. All were laundered at home, never by a professional laundry."

The use of the correct thread is most important as evidenced by this letter. His letter also points out the poor wearing qualities of the resin-finished cotton fabrics, which we had mentioned previously.

Wash-and-wear is a most important development in the textile industry. However, there are still many "bugs" to be worked out.

ADVERTISING———"I want to return it because it doesn't meet the claims!"

The biggest disappointment among users of wash-and-wear merchandise is that the fabrics do not seem to meet the claims made for them. Yet, we have fewer written complaints and returns for this reason.

The customer is extremely pleased with the idea and she is lured into making a purchase by the glowing claims for miracle-making easy care.

But there have been unpleasant realities to face. If a garment does not perform she feels that she has been misled and tends to misjudge claims made for other products. She becomes a skeptic and that is not good.

The comments most often made regard the "drip-dry", "need-no-ironing" claims. These are only a small fraction of what we have heard customers say about such claims on hang tags and in advertising:

"Messy job to hang dripping—almost all must be touched up, and would just as soon do regular ironing job."

"Haven't found one that doesn't require ironing. Followed laundering instructions carefully but for me they still appear wrinkled after laundering."

"They require special handling in rinse and unless they can be dried outdoors, there is a pool of water in basement where they are hung. Ironing requires a little more care."

"Find some labels misleading, for even though they don't require dampening, they need more than a "little" ironing."

"Wash-and-wear requires separate treatment. Prefer materials I can wash together and that look really smooth when ironed. Too many wash-and-wear's don't really look neat and seem to resist ironing."

"Drip dry is such a nuisance that I rarely bother with it."

"Many garments marked drip dry are really not. Resins wash out after several washings and fabric is no longer drip dry."

We could go on and on with comments similar to these, but time does not allow it. Also, very few homemakers have space and facilities for drip drying a complete wardrobe for an average family, unless the family is planning a house such as described recently in a short poem found in one of the weekly magazines:

MODERN HOUSE

No matter how many rooms it has
To cook, or eat or lie in
It ought to have at least two baths
For drip-dries to drip dry in.

Along the same line, another consumer raised the question of correct handling of "no ironing-drip-dry cotton garments". She had followed instructions regarding hand washing and hung the item dripping wet on a hanger. After drying, the item looked unironed. The specific questions raised by the consumer were:

1) What variation in method is suggested for success as advertised "no iron"?
2) If it has to be pressed, then can it be machine washed?
3) If it is once pressed, will it lose its "no-iron" quality permanently?
4) Why can't a detergent be used?

In the same vein, is this letter written by a consumer.

"I feel required to voice my extreme disappointment in the general selection of so-called *"easy-care"* fabric dresses. I fail to understand how, in this wonderful age of automatic washers, any garment which must be washed by hand can be thought of as easy-to-care-for. If one must spend ten or fifteen minutes washing a dress by hand, carefully placing it on a hanger to drip-dry, *and then* 'touch it up lightly with an iron', would it not be just as well to buy good old cotton, toss it in the machine and put the above-mentioned time into ironing? I do not see where any time is saved.

"Most automatic washers are advertised as having a 'new Wash 'N Wear cycle in which your Wash 'N Wearables come out wrinkle free . . . ready to wear'. Surely you want to think of your customers as buying these Wash 'N Wearables and then happily tossing them into their new washers!

"As a homemaker and mother of three children, I am constantly looking for ways to make life easier and more pleasant. Ironing is always a big chore, especially in the summer, but if I buy the 'easy care' dresses I will be hand washing and 'touching up'. As far as I'm concerned, that term 'touching up' is a farce. When one sets up an ironing board, plugs in the iron and pushes it back and forth, *it's ironing.*

"If a garment is really easy to care for it can be put into an automatic washer and taken out damp to hand *smooth* or else spun dry and *smooth.* Anything else cannot truly be represented as easy to care for.

"Would someone kindly explain to me why Dacron/cotton dresses cannot be machine washed?

"Let us be honest about 'easy care' garments."

Based on these comments, it is evident the average customer dislikes to "puddle" things out by hand, thus she is mixing her wash-and-wear merchandise with her other laundry regardless of directions on hang tags. No customer has enough wash-and-wear for a full load in the washer and sometimes she may not even have adequate equipment; therefore, individual items are put in with regular loads and do not receive proper treatment.

Recently there has been more concentrated effort by manufacturers to want to advertise their items as "automatic wash-and-wear" or "tumble dry" because tumble drying usually results in the garment having a better appearance. However, articles should not be sold as "wash-and-wear" just because they come out of the dryer with fewer wrinkles. How are the consumers who do not have dryers going to dry these garments? And there are many in this category. From a summary published in the January, 1958 issue of *Electrical Merchandising,* it can be found that only 13.7% of the wired homes in the United States have dryers. This means that a large majority must dry these garments by some other means.

When a customer sees a "wash-and-wear" label on a garment, she thinks of how she is going to care for it, keeping in mind her facilities, not those used by the finisher or retailer when he tested the fabric. She may have an old-type conventional washer and nothing but a clothesline on which to dry her laundry. Consequently, she couldn't follow a label reading "wash at slow speed and tumble dry to insure best results." We should be able to provide her with a wash-and-wear garment that is satisfactory no matter whether it is hand- or machine-washed and drip, line- or tumble-dried.

Garments do need ironing if the woman is particular about the appearance of her family and herself. This dress purchased by my secretary has been hand-washed and drip-dried. She would not wear it without ironing and ends up dampening it and pressing it as she would an untreated cotton.

GOOD POINTS———All is not black and dreary in the wash-and-wear picture. It has real utility and value. Customers like the idea of less ironing and easy care of garments. In almost every case, the wash-and-wear garments need less ironing than do untreated ones and they also press out smoothly with less effort than necessary for the "old-fashioned" fabrics. The most carefree wash-and-wear garments

are prints or plaids which tend to conceal pebbling.

But, customers feel that we have promised too much in saying "wash and wear" and so have let the homemaker down. We haven't told them about the limitations of the finishes.

There needs to be broader education of the consumer and the retailer as well as an improvement in fabric, finish and fabrication. I'm sure each of you has heard comments similar to these previously. But each has said to himself . . . "My fabric is not like that, so I need not be concerned." However, it is the responsibility of all of us to separate the good from the bad so that the wash-and-wear idea is not destroyed.

◆◆◆

Wash-and-Wear or Easy-Care Testing Methods and Standards—

(Concluded from P890)

clude pressed-crease retention in our evaluation when required. This is something others may have considered, but not as yet, to my knowledge, worked into any other fabric or garment evaluation. Swatch or garment evaluation is based on appearance after washing and drying before touch-up to our rating scale, and this is the final wash-and-wear or easy-care rating of that fabric or garment. Those needing pressing or ironing are given a supplementary class rating only to determine to what extent wrinkles are removed in ironing. Swatches or garments needing touch-up or ironing that are not restored to at least a 4.5 rating after ironing do not qualify for a wash-and-wear or easy-care rating, but may meet a washable or hand washable rating, depending on whether they meet other spec requirements. There can be instances wherein pressed-crease retention is required for the end use, where a fabric could have wrinkle-free surface appearance but no pressed-crease retention, or the reverse, ie, where pressed crease is excellent but surface appearance is badly wrinkled. In either instance, swatch or garment would not meet wash-and-wear or easy-care requirements but would be placed in a washable or hand washable category, whichever it met. If pressed-crease retention or pleat retention was not required, however, we would accept a fabric with a wrinkle-free appearance for wash-and-wear or easy-care end use. So you see, acceptance will vary with end-use.

9) In addition to screening of fabrics, we also make tests on garments made of potential wash-and-wear fabric for shrinkage, surface appearance and pressed-crease retention, if necessary, and follow up with actual wear tests on garments showing most promise in preliminary lab tests.

Our minimum serviceability requirements vary with each end-use, but are the same for either one of our three wash-and-wear categories, and cover the same points of breaking, seam and tongue-tear strengths, shrinkage, colorfastness, abrasion, odor and other special finish requirements which may vary according to end-use.

At the beginning of this paper, I noted that the full cooperation of the entire industry will result in even greater acceptance of wash-and-wear or easy-care by the consumer.

The industry has been doing a fine job, but has been handicapped by the fact that, although all segments are fairly close in understanding on washing and drying test procedures, this is not so with respect to methods of evaluation.

Webster's Dictionary defines a standard as "that which is established by authority as a fixed rule, measure, value or quality," and this is exactly what we need—a measure and an understanding of value which we can assign to a fabric surface appearance, pleat or pressed crease by visual examination so that, based on amount or degree of wrinkling, pleat or pressed crease retention, it will be assigned the same class rating after laundering and drying in Charlotte, New York or just anywhere where testing is being done. This kind of rating should be easily understandable to all from the fiber manufacturer to the consumer and should be possible through easy visual examination, under standard lighting to photographic standards.

Once the industry has the performance standards as a yardstick, each segment, whether it be the yarn manufacturer, the chemical industry, the weaver, converter or garment manufacturer, will then be able to evaluate its progress in this respect.

Although all segments of the industry are considered very essential to the production of a wash-and-wear item of garment, probably the two most important are: 1) The fabric sales division, which will sell fabric to garment manufacturer under the proper wash-and-wear or easy-care category; and 2) the garment manufacturer, who will have the job of selecting all parts of a garment, including the outer fabric as well as component parts, such as trim, sewing thread, etc, uniting them all through scientific garment manufacturing technique into a true wash-and-wear garment.

After all the screening and evaluation of fabric and garment has been done, the last and next important step is to instruct the consumer in the matter of proper care to insure best performance. An honest, simply stated handling instruction on a sew-in label is a must to make wash-and-wear become a reality not only in the laboratory but on its final testing ground—the consumer.

AATCC Calendar

COUNCIL, COUNCIL COMMITTEES, RESEARCH COMMITTEES

Jan 28-30 (Hotel McAlpin, New York, NY)
Jan 28—Research Committees
Jan 29—Council Committees, TCR, ECR
Jan 30 (AM)—Council Meeting

May 30, 1959 (Mount Royal Hotel, Montreal, Canada)

NATIONAL CONVENTIONS

Oct 8-10, 1959 (Sheraton Park and Shoreham Hotels, Washington, DC); Oct 6-8, 1960 (Sheraton Hotel, Philadelphia, Pa.); September 28-30, 1961 (Buffalo, NY); 1962 (Southern Region)

HUDSON-MOHAWK SECTION

Jan 16 (Jack's Restaurant, Albany, NY); Mar 27 (Chelsea House, Tribes Hill, NY), May 15 (Ladies night, Albany area); June 26 (Annual outing—Antlers Country Club, Tribes Hill, NY)

NIAGARA FRONTIER SECTION

Feb 20 (Niagara Falls, Ont); April 4 (Hamilton, Ont—joint meeting with CATCC)

NORTHERN NEW ENGLAND SECTION

Jan 16 (Colonial Club, Lynnfield, Mass)

PIEDMONT SECTION

Jan 24 (Poinsett Hotel, Greenville, SC); April 10-11 (Robert E Lee Hotel, Winston-Salem, NC); June 5-7 (Outing—Grove Park Inn, Asheville, NC); Sept 25-26 (Barringer Hotel, Charlotte, NC)

SOUTH CENTRAL SECTION

Jan 10, Mar 21, Sept 19 (Hotel Patten, Chattanooga, Tenn); June 26-27 (Outing — Riverside Hotel, Gatlinburg, Tenn)

37th National Convention ———

REMAZOL COLORS

A Chemically New System of Fiber-Reactive Dyestuffs*

DR E P SOMMER
Carbic Color & Chemical Co, New York, N Y
Hoechst Chemical Corp, West Warwick, R I

A new chemical system of fiber-reactive dyes is discussed. Differences between the Remazols and other fiber-reactive dyes are explained. Different dyeing methods are described, especially for continuous dyeing either by the pad-steaming method or curing method. Printing methods of all kinds are discussed in detail, showing the possibilities of new styles.

INTRODUCTION

DURING the last 15 months we have read a lot of reports, scientific papers, etc in our trade magazines as well as in the specific brochures about reactive dyestuffs, sometimes also called fiber-reactive or cellulose-reactive dyes. For that reason it would be useless repetition of what has been said already—partly during previous AATCC meetings—if I would go again into all details so as to prove that certain new dyestuff groups do react with hydroxyl groups of cellulose under certain conditions, thereby forming an integrate part of the cellulose molecule itself. The available literature on this subject is listed for your convenience at the end of this paper. This literature is already so extensive that it seems in order to survey the historical and chemical background of reactive dyestuffs at this juncture.

At the same time, such a survey will explain the differences and similarities between the three fiber-reactive dyestuff groups known under their respective trade names of Procion, Cibacron, and Remazol.

HISTORICAL AND CHEMICAL BACKGROUND

New trademarks, when several of them within a brief period of time start aiming at the same target, are rather bewildering for the busy colorist or plant manager. And he wants to know: "What's in a name?" What are the differences or advantages of one type against the other?

Rather than making a flat statement that the latest of the three groups washes quicker to final shades and to final fastness properties after the fixation cycle is finished, I intend to explain this by comparison of the chemical structure of the three dyestuff groups involved.

After it became apparent that some of the hydroxyl groups in the cellulose molecule can be made to react much easier than it was thought possible before, attempts started on both sides of the Atlantic to create dyestuffs which, while soluble in water like regular direct dyestuffs or acid dyes, would reach much higher levels of washfastness by virtue of chemical linkage with the cellulose molecule itself.

Reactive dyestuffs for wool were synthesized more than ten years ago and finally marketed about 1952 under the name of Remalan colors by Farbwerke Hoechst AG in Frankfurt/-Main, Germany. At the same time there were indications in the research laboratories in Hoechst that similar chemical compounds could be reacted with cellulose. But the resulting dyeings and prints would not meet the very-high-boiling soda-soap fastness specifications as they existed on the European continent.

Regardless of what was going on in European research laboratories at perhaps earlier dates, the first person ever to speak in public about cotton-reactive dyestuffs, which he synthesized himself, was John D Guthrie of the Southern Regional Research Laboratory, New Orleans, when he read his paper "Attachment of Dyes to Cotton by Ether Linkage" at the 30th annual AATCC convention October 17, 1951 in New York (See Figure 1).

Proceedings of the
American Association of Textile Chemists and Colorists

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JANUARY 7, 1952

30th Annual Convention
Dyeing Group—

ATTACHMENT OF DYES TO COTTON BY ETHER LINKAGE

JOHN D GUTHRIE

Southern Regional Research Laboratory, New Orleans, La.

INTRODUCTION

EXPERIMENTAL

Figure 1

*Presented October 30, 1958 at the Conrad Hilton Hotel during the 37th National Convention.

Guthrie, during his studies pertaining to modification of cotton cellulose, found that dyestuffs containing a sulfato-ethyl-group attach themselves with good washfastness to cotton fiber itself. However, cotton impregnated with such dyestuffs had to be heat-treated for one hour at 100-110°C in a 20% caustic soda solution so as to obtain an ether linkage between dyestuff and cellulose molecule. Such a procedure is, of course, not suitable for practical application; but the principle had been stated for the first time in public. Furthermore, Guthrie synthetized some other dyestuffs containing *chlorethyl* groups instead of sulfato-ethyl and found the chlorine to react even quicker with cellulose in 20% caustic soda solutions although still much too slow for commercial exploitation *(1)*.

It is to the credit of Vickerstaff and his team at the Dyestuffs Division of Imperial Chemical Industries Ltd in Manchester, England, to have found that chlorine atoms at the *cyanuric chloride* ring react very quickly with the hydroxyl groups of cellulose in the presence of mild alkalis, such as soda ash or bicarbonate of soda; and that dyestuffs containing cyanuric chloride with two available chlorine atoms form a firm ester linkage with cellulose under variable and relatively mild alkaline conditions *(2)*. (See Figure 2).

The cyanuric acid ring system is nothing new in dyestuff chemistry. Erwin Ott at the University of

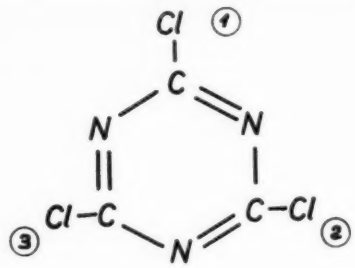


Figure 2

Muenster, Germany, many years ago suggested vat dyestuffs to be made from cyanuric-tricarboxylic acid and alpha-amino-anthraquinone. These dyestuffs did not offer any advantages over earlier vat dyes existing in Germany at that time. But Ciba in Basle, Switzerland, extended the use of the cyanuric ring system by reacting amino-azo dyes with cyanuric chloride to form new dyestuffs of very good lightfastness, which were substantive on cotton. Grimmel wrote *(3)* as follows:

"Cyanuric chloride offers the distinct advantage that replacement of each successive chlorine becomes increasingly difficult. Thus, the first chlorine atom is reactive even in the cold, the second only at room temperature and above, and the third usually requires refluxing in an aqueous solution or in some cases even anhydrous conditions at much higher temperatures."

This remark explains the differences between the more-reactive and cold-dyeing Procion colors and the less-reactive Cibacron dyestuffs, as we will see later.

Figure 3 shows the constitution of a typical cyanuric chloride direct dyestuff called "Chlorantine Fast Green BL" as published in the aforementioned book *(3)* on page 294.

All three chlorine atoms of the cyanuric chloride ring system have been substituted 1) by a blue amino azo dyestuff, 2) by a yellow amino azo dye, and 3) by aniline.

The resulting green dyestuff exhausts on cotton, it is very fast to light; but its washfastness is only moderate, because no reactive chlorine atom is left in the cyanuric chloride ring to form an ester linkage with the cotton itself.

As mentioned before, Vickerstaff and his team at ICI discovered that available chlorine atoms left a cyanuric chloride dyestuff will react quickly with cellulose hydrocyl; and they called such compounds *Procion colors (2,4,6,7)*; the general formula of which is shown in Figure 4.

These earlier Procions, containing two available chlorine atoms, react very easily with cellulose. They also react easily with water, and therefore have to be dyed at room temperature. On account of their bright shades, they are of interest for printing on vegetable fibers. From now

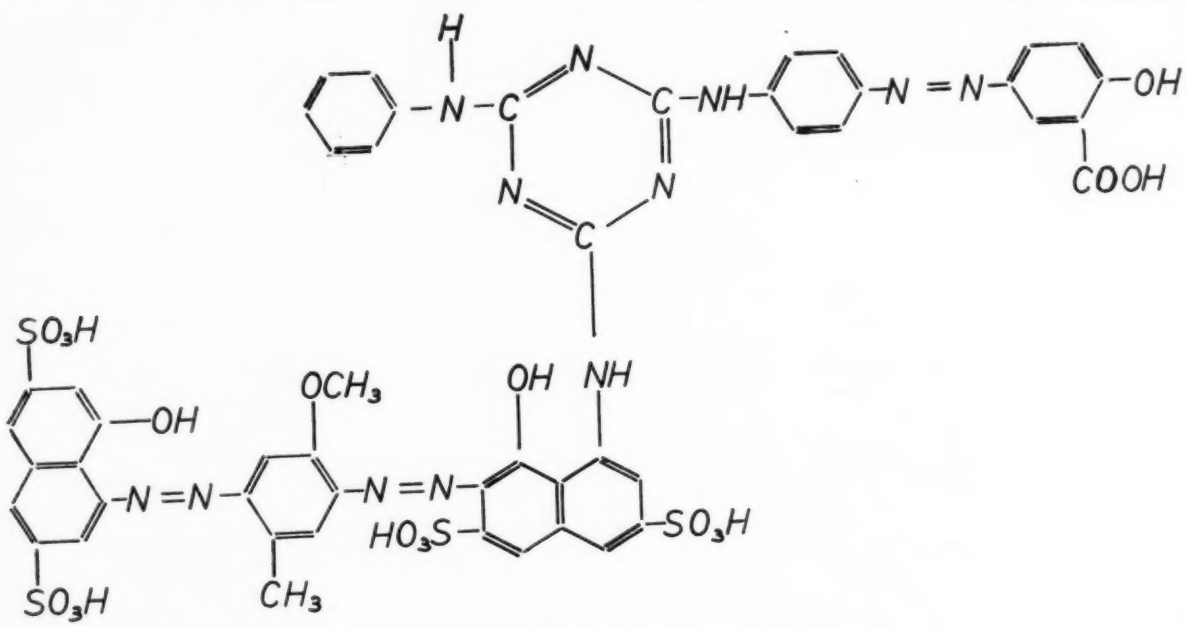


Figure 3
Chlorantine Fast Green BL (Direct Green 26, CI 34045)

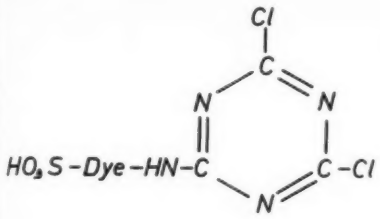


Figure 4
Cyanuric-dichloride reactive dye

on I shall call them cyanuric-dichloride reactive dyes, in contradistinction to the cyanuric-monochloride reactive dyes, which are represented by the Cibacron colors of Ciba Co, Inc and Procion H-colors of ICI.

A cyanuric-monochloride reactive dyestuff, which usually is of better stability in aqueous solution *(8)*, would be of the structure shown in Figure 5a.

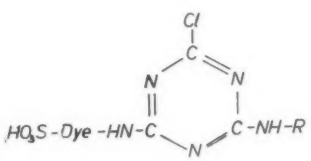


Figure 5a
Cyanuric-monochloride reactive dye

A cyanuric-monochloride reactive dye having two dyestuff structures linked up with one cyanuric-chloride molecule very often has higher affinity to cotton. But the same is also the case sometimes with the product of saponification when part of the dyestuff has reacted with the water in the presence of which dyeing or printing on cellulose surfaces takes place (Figure 5b).

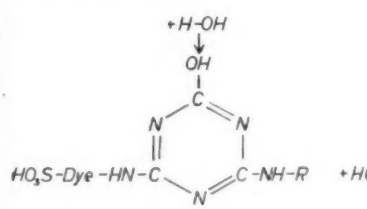


Figure 5b

The solubility of these chemical compounds, like of any other soluble dyestuff, depends on the number and distribution of salt-forming sulfonic acid groups. But everything else being even, it stands to reason that enlarging the molecular size sometimes results not only in increased affinity but also in decreased solubility of such products. The famous "wash-down" of fiber-reactive prints has lately been an often-discussed problem in the print works. The printer is reconciled to losing some of his dyestuff input due to inactivation by side reaction with water. But with regard to high-speed production, he expects his fixed fiber-reactive prints to be washed clean of unfixed color by a simple continuous operation in an open-width washer. He dreads the possibility of the "wash down" dyeing back into the white ground of his prints when running at high speed through a continuous open-width scouring range; or when batching up wet prints after open-width scouring and before going over dry cans or through a tenter frame, etc.

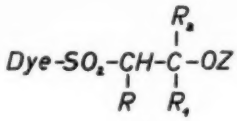
Also, when dyeing plain shades on piece goods, the final wetfastness properties will depend on a complete removal of unfixed color, which preferably should be accomplished by open-width scouring in about six or seven boxes of a continuous pad-steam dyeing range.

While the monochloride- and dichloride reactive dyestuff groups are two different versions of the same general principle, namely cyanuric chloride derivatives, the third fiber-reactive dyestuff group is chemically completely different.

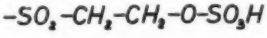
These Remazol dyestuffs were brought out, about a year ago, by Farbwerke Hoechst AG, in Frankfurt/Main, Germany. They are covered by patents in this and in most other countries; and they are manufactured at Hoechst Chemical Corp in West Warwick, RI. Chemically I would describe them as vinyl-sulfon reactive dyestuffs. As they do not contain cyanuric chloride, their reactivity is not based on a chemical ring system which entails residual affinity for chlorine or chemicals with hydrolizing influence. This is important with regard to chlorine fastness as well as for resin finishing. In other words, such properties as chlorine fastness or stability to resin finishing are solely functions of the original soluble azo dyestuffs or whatever the case may be. And these properties are not altered by conversion into a fiber-reactive Remazol.

The general chemical formula of a Remazol dyestuff is shown in Figure 6.

Unlike Guthrie's sulfato-ethyl dyestuffs, the vinyl-sulfon derivative group of Remazols reacts very quickly, forming an ether linkage with cellulose in the presence of alkali. And yet the solutions of Remazol dyestuffs are stable in



Z = SO_3H or otherwise



Typical reactive group

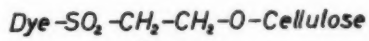


Figure 6
Cellulose-dye-ether

boiling water at a neutral pH. Thus these reactive dyestuffs offer an entirely new tool for high-speed continuous pad-steam dyeing on cotton piece goods as well as for textile printing.

The unfixed portions of vinyl-sulfon reactive dyestuffs, having reacted with water, are very soluble and have no affinity at all to cellulose. They, therefore, are easily removed by a short scouring process.

On the strength of above chemical explanations, it can be truly stated that the three different trademarks for the three reactive-dyestuff groups are more than just three different names. Representing

1) cyanuric-dichloride reactives,
2) cyanuric-monochloride reactives, and
3) vinyl-sulfon reactives,

they entail certain modifications of application methods; but all three follow more or less the same general principles with regard to application technique.

We now can proceed to discuss some practical aspects of printing and dyeing with vinyl-sulfon reactive dyestuffs.

DISCUSSION OF PRINTING AND DYEING

PRINTING——In the making up of a textile print paste, the vinyl-sulfon reactive Remazol dyestuff is dissolved in hot water together with urea. The solution thus obtained is stirred into neutral alginate thickening. After cooling, sodium bicarbonate is added. A typical formula would be as follows:

4 ozs	vinyl-sulfon reactive dyestuff
12 ozs	urea
¼ gal	hot water
½ gal	neutral alginate gum
2 ozs	bicarbonate of soda, dissolved in
⅛ gal	water
1 gal	bulk

A minimum concentration of 1.5 ozs bicarbonate of soda is required also for pale pastel shades. Practical ex-

perience has proven that sometimes a further addition of one oz sodium m-nitrobenzenesulfonate (eg, Ludigol[1]), per gallon print paste improves color yield and brightness of shade.

Since the beginning of this year we have recommended replacement of alginate gum by an OW-emulsion carrier, employing carboxymethylcellulose and an emulsifier together with Varsol[2] No. 2. This printing carrier has proven to be very efficient and cheaper than others suggested. Detailed data are available in pertinent brochures.

The prints are fixed within five minutes neutral steaming; subsequently flush-rinsed, preferably with simultaneous application of a power spray; then rinsed hot, followed by scouring near the boil with 0.25 oz soda ash per gallon; finally rinsed hot and dried. The unfixed part, due to the unique chemical construction of the Remazol system, has no affinity to cellulose fiber at all and therefore washes off easily without staining into the white bottom of the print pattern during open-width rinsing and soaping in the continuous range. Vinyl-sulfon reactive dyestuffs are easy to handle in this respect; although, because of the high tinctorial power of such colors, the first rinse water will be profusely tinted by the unfixed part of the prints.

The prints exhibit very good to excellent washfastness when subjected to AATCC wash test #3.

Some Remazols, being fast to chlorine, will withstand even an AATCC wash test #4. The lightfastness varies between 4-5 and 7, depending on the shade.

Crockfastness as well as stability to drycleaning solvents and plastic coating are excellent with all vinyl-sulfon reactive prints; and as a class, they are better than azoics and better even than some vat colors.

The Brilliant Blue R happens to combine highest brilliancy of shade with best all-round properties. It also happens to be the quickest one with regard to speed of fixation.

Fixation of Remazol prints in neutral steam allows a simultaneous application of neutral developing azoic print pastes and of vat colors in the same print pattern. Very good fall-on effects are obtained with vinyl-sulfon reactive prints under or over neutral developing azoic reds, oranges, bordeaux, and yellows of the Rapid Fast Color type; Rapidazol Black R has found wide use for outline blacks and fall-on effects together with all three groups of reactive dyestuffs. On the other hand, the regular diazo amino types of azoic printing reds, etc do not develop in neutral steam in the presence of fixed alkali.

Pigments of the oil-in-water emulsion system are likewise suitable for printing alongside fiber-reactive dyestuff pastes. But the water-in-oil emulsion type of pigment pastes is less suitable for this purpose.

Thus an entirely *new possibility of styling of cotton prints* with good fastness properties has become available, by selecting the brightest shades of different dyestuff groups; and fixing same simultaneously in the same pattern by a simple neutral steaming operation.

The versatility in styling of cotton prints has been enhanced further by the fact that *all available sulfon reactive dyestuffs are dischargeable to a white* with a strongly alkaline sulfoxylate discharge paste. Pad dyeings with Remazol Brilliant Blue R require the further addition of Leucotrope[3] WX (calcium salt of disulfonated dimethylphenylbenzylammonium chloride) to the discharge print colors.

On the other hand, vinyl-sulfon reactive dyestuffs preprinted according to the regular bicarbonate method and after fixation in neutral steam exhibit an excellent resisting power toward subsequently overpadded leucovat ester solutions (chlorate-vanadate-method). Such *fiber-reactive resists* under leucovat ester pad dyeings have been produced in quantity already successfully in this country. The ease with which such fiber-reacted resists can be obtained under soluble vat esters cannot be explained by the rather minor amounts of bicarbonate in the resist prints; and the suspicion cannot be entirely rejected that linkage between cellulose and dyestuff slows down to some extent the strike or absorption of subsequently overpadded soluble vat esters.

Unfortunately, the limited time does not permit mention of further details, for example with regard to vinyl-sulfon-reacted resists under aniline black, etc.

DYEING WITH REMAZOLS——The fundamental fact to consider is the complete lack of substantivity of vinyl-sulfon reactives on cellulose in the absence of salt in the dyebath at a neutral pH.

When six ozs per gallon of common salt or calcinated Glauber's salt are added, a small to moderate exhaust is noticeable; and when, by the addition of soda ash or trisodium phosphate, a pH of 10.5 or higher is reached, the exhaustion curve goes up rather quickly (in the case of Remazol Brilliant Blue R, up to 85-90%). The other vinyl-sulfon colors exhibit a lower exhaust on cotton than the blue, also in the presence of trisodium phosphate.

The best dyeing temperature on cellulose fiber for the entire range is about 140-150°F.

The amount of dyestuff exhausted on the fiber must not be confused with the amount fixed by ether linkage with cellulose. The percentage of fixation has been determined and found to vary between 60-90% on bleached cotton, Remazol Yellow RT being the lowest and Black B the highest in this respect. The majority of vinyl-sulfon dyestuffs is in the neighborhood of 75-80% on cotton.

Mercerized cotton dyes considerably stronger, which in turn is surpassed by spun rayon, filament viscose rayon and cuprammonium rayon (in the order listed). The yield differences between the various cellulosic fibers are more pronounced with reactive dyes due to the superimposition of the two factors: exhaust and reactivity. The latter is not only a function of the individual dyestuff but also of the type of cellulosic fiber itself.

Remazol Brilliant Blue R has been dyed successfully on jigs, and large quantities have been dyed for knit-goods on yarn in package-dyeing machines. New vinyl-sulfon dyestuffs of high affinity from long liquor ratios are in preparation.

As mentioned previously, the available Remazol dyestuffs have no affinity to cotton in the absence of salt at a neutral pH. This property renders them ideally suited for *continuous dyeing* on cotton piece goods according to the *pad-steam method*.

The dyestuff solution in this case is padded without any further addition (except for small amounts of surfactant), either at room temperature or up to 180°F, the choice of temperature depending on the goods to be dyed.

After going through a hot air drier, the goods are passed through a chemical pad, containing one to two and one-half ozs caustic soda 72°Tw and two and one-half lbs common salt per gallon cold pad liquor (or at room temperature).

From the chemical pad, the goods are immediately put through a steam box for about 20 seconds, subsequently rinsed hot and scoured open width with 1/10 oz detergent per

[1]General Dyestuff Co.
[2]Esso Standard Oil Co.
[3]General Dyestuff Co.

gallon; and finally rinsed if necessary, with 1/2 oz acetic acid 56% per gallon, so as to neutralize remnants of alkali.

Complete fixation is obtained within 20 seconds steaming with the above chemical pad composition. Remazol Brilliant Blue R fixes within 15 seconds at 220°F. Thus it is possible to obtain dyeing speeds up to 120 yards per minute in continuous ranges as they have been set up for continuous pad-steam dyeing of vat colors.

On the strength of detailed timing studies, it can be said that vinyl-sulfon dyestuffs as a group and under above-described conditions lend themselves particularly well for high-speed continuous dyeing on cotton piece goods, and are unsurpassed in this respect.

Excess caustic soda in the chemical pad or excess duration of steaming will sometimes produce weaker dyeings. Therefore, when the continuous-dyeing range cannot be geared fast enough, perhaps resulting in 40 seconds steam exposure, the concentration of the caustic soda 72°Tw will have to be cut back to 1.5 ozs or one oz per gallon in the chemical pad, depending on the shades and nature of the goods to be dyed, and on the temperature or conditions of steam.

The concentration of common salt is constant at 2.5 lbs per gallon irrespective of depth or nature of shade.

To complete the report on *continuous dyeing*, it should be mentioned that the *bicarbonate method* as described in the printing section can be used also for pad dyeing. In this case the vinyl-sulfon reactive dye is padded together with urea and 1.5 to three ozs per gallon of bicarbonate (depending on the depth of shade), then dried in a hot air drier. Fixation is obtained either by five minutes vat aging in a Mather Platt-type ager or by *thermofixation*, meaning a dry heat treatment for about three minutes at 300°F. Thermofixation usually requires twice the concentration of urea in the pad liquor, as against fixation by means of vat aging. For thermofixation of medium-heavy shades as much as four ozs per gallon of bicarbonate might have to be used; or two ozs soda ash per gallon pad liquor.

The bicarbonate-vat-aging method is of interest for continuous dyeing of discharge bottoms in print works, where no pad-steam vat dyeing range is available.

The thermofixation method is valuable for those dyehouses where no real continuous steaming equipment is available.

The best yield, brighter shades and in some cases better fastness are obtained by means of pad-steam fixation.

Now a final word about *resin finishing* of Remazol dyeings. As a group they are very good with regard to stability of shade in resin finishing. Also, with cyclic ethylene-urea treatment the shade changes of these colors are negligible. But the latter resin causes a decided drop in lightfastness when the resin-treated goods are not washed after curing. Much better lightfastness is obtained after neutral washing, particularly when zinc nitrate has been used as catalyst. Newer types of urea-formaldehyde resin, together with proper choice of catalyst produce high-grade permanent finishes on vinyl-sulfon reacted dyeings without seriously damaging the lightfastness properties, even when the resin-treated goods are not washed neutral after curing.

Fade-Ometer exposures of resin-finished fiber-reactive dyeing sometimes show inferior lightfastness ratings than parallel exposures in sunlight. Generally speaking, the problem of lightfastness of Remazol dyeings with resin finishes is well under control, thanks to many hundreds or thousands of systematic tests on record.

There are many more details, which unfortunately have to be left unmentioned because of lack of time. But it should be mentioned that Remazols can be dyed successfully on wool, silk, nylon, and Acrilan.

LITERATURE CITED

(1) Guthrie, J D, "Attachment of Dyes to Cotton by Ether Linkage," *Am Dyestuff Reptr* **41**, No. 1, P13-14, P30, Jan 7, 1952.
(2) Vickerstaff, T, Reactive Dyes for Textiles," *J Soc Dyers Col* **73**, No. 8, 237-47, June, 1957.
(3) Grimmel, H W, in "Organic Chemistry," Vol III, page 293; Henry Gilman, editor; John Wiley & Sons, New York, NY.
(4) Vickerstaff, T, "Fast Dyes for Cellulosic Fibers." *Am Dyestuff Reptr* **47**, No. 2, 33-8, Jan 27, 1958.
(5) Ziegler, O, "Remazol Farbstoffe," *Textilber* **39**, No. 1, 66-7, Jan 1958.
(6) Fox, Maurice R, "Reactive Dyestuffs in the Dyeing of Cellulosic Textiles," *Am Dyestuff Reptr* **47**, No. 12, P413-7, June 16, 1958.
(7) Vickerstaff, T, "Reacktive Farbstoffe fuer Textilien," *Textilber* **39**, 765-71, July 1958.
(8) Schlaeppi, F, "Some Aspects of Cellulose-Reactive Dyes and Practical Experience in Their Application," *Am Dyestuff Reptr* **47**, No. 11, P377-83, June 2, 1958.
(9) Fowler, J A, and Preston, C, "The Application of Reactive Dyes to Viscose Rayon," *J Soc Dyers Col* **14**, No. 5, 372-81, May 1958.
(10) Wegmann, J, "Synthetische Faerbungen und Drucke," *Textilber* **39**, 1006-12, Sept 1958.
(11) Brindley, R A, and Rattee, I D, "Die Andwendung der Procion-Farbstoffe in Kontinue-Verfahren," *ibid* **39**, 1017-22, Sept 1958.
(12) Zimmermann, H, Zur Kenntnis der Remazol-Farbstoffe," *ibid* **39**, 1026-7, Sept 1958.

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(Continued on page P902)

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WILLIAM POSTMAN
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"The Demetallization and Leveling of Chrome-dyed Wool Pieces"

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"Remazol Colors—A Chemically New System of Fiber-reactive Dyes"

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PROPOSED AMENDMENTS TO THE CONSTITUTION

AATCC is incorporated under the laws of the Commonwealth of Massachusetts. It is the opinion of the Association's general counsel that, for full compliance with these laws, election of national officers must be at an Annual Meeting for this purpose and not by means of mail only. The amendments below to Articles VI and VII of the Constitution, in the opinion of the counsel, permit compliance with legal requirements by employing proxies in place of actual ballots. The proposed amendments introduce no other changes and suitable precautions will be taken to preserve ballot secrecy.

Prior to the 211th meeting of the Council on September 19, 1958, the chairman of the Committee on Constitution and Bylaws, acting as the original proponent, presented to the executive secretary a proposal to amend the Constitution supported by the signatures of 102 Senior Members. The proposal was presented to the 211th Council meeting for discussion and was then referred to the Committee on Constitution and Bylaws in accordance with Article VIII covering amendments. The proposed amendments were submitted without change to the next following meeting of the Council on October 30, 1958. By majority vote, the Council approved the proposed amendments.

The proposed amendments are published herewith as required by the Constitution and will be submitted to vote of the entire Senior membership of the Association on ballots mailed with the next ballot issued for election of officers for the Association.

Article VI

Nominations and Elections

Section 3. Substitute the following for the first paragraph:

The Executive Secretary shall mail to each Senior member by October 10th of each year a ballot bearing the name of every nominee for President, and of every nominee for Vice-President from that member's region. The ballot shall show the time and place of the Annual Meeting at which it may be cast, and will include a proxy form empowering the Executive Secretary to cast the ballot as instructed by the member executing the proxy. A duly executed proxy, properly marked and received by the Executive Secretary within six weeks of his mailing date shall be cast as a ballot, according to the member's instructions in the proxy, by the Executive Secretary at the Annual Meeting of the Association within the seventh week after said mailing date. Such proxy ballots will be equal in weight to those cast in person by Senior members attending the Annual Meeting, who have not executed proxies.

Senior members who have executed and forwarded proxies, may, at the Annual Meeting, by advice to the Executive Secretary, cancel their proxies and participate in the voting. The ballots shall be counted by the Executive Secretary and two tellers appointed by the President.

To each office that candidate receiving the largest number of votes shall be declared elected.

(The second and third paragraphs of Section 3 are not changed, and become paragraphs 4 and 5).

Article VII

Meetings

Substitute the following for Sections 1 and 2, respectively:

Section 1. The Council shall designate the time and place of the Annual Meeting of the Association for election of National Elective Officers, to be held in November of each year. For this meeting a quorum of 25 Senior members will be necessary, not including proxies sent to the Executive Secretary.

Section 2. Meetings of the Council shall be called through written notice to each of its members as provided in the Bylaws, with a minimum of three meetings per calendar year.

Section 3 is to be eliminated, being replaced by proposed Section 2.

NOTICE TO SECTION OFFICIALS

TO ensure that the activities of your section receive proper publicity in the *Proceedings*, it is desirable that material be submitted direct to American Dyestuff Reporter, 44 E 23rd St, New York 10, N Y.

ADVANCE NOTICES OF MEETINGS———Copy must be submitted *at least two weeks* prior to the publication date. ADR is published on alternate Mondays. It is urged that these dates be taken into consideration when copy is submitted.

Advance notices should include the date and site of the meeting; the speaker's name, position, business affiliation, and subject; a short abstract of the paper (optional); details of additional meeting highlights, eg, nominations or election of officers, special awards, activities of Sectional committees, etc.

MEETING REPORTS———Complete reports should be submitted as soon as practical after a meeting. Information should include attendance figures; captioned photographs of meeting principals (speaker, section officials, etc); and any additional points not covered in the advance notice. An extensive resume of the speakers' remarks is not necessary if the paper is to be submitted for full publication in the *Proceedings*.

PAPERS———Two copies of each paper presented before local sections should be sent to the offices of the American Dyestuff Reporter. It is very important that every speaker be acquainted with the "Notice to Authors", which appears periodically in the *Proceedings*. Additional copies of said notice will be sent to section officials on request.

It is imperative that each Section appoint an official whose responsibility it is to see that the speaker's remarks are submitted. In cases where prepared manuscripts are not immediately available to the Section official, it may be necessary to acquaint the author with the address to which he should send his material when it is finally prepared.

In cases where the material is extemporaneous (panel discussions, question-and-answer periods, open forum, etc) it is the responsibility of the Section to provide for stenotype service, so that a complete record may be available.

PRESENTATION OF A PAPER BEFORE A LOCAL SECTION DOES NOT GUARANTEE PUBLICATION IN THE PROCEEDINGS, AS THE FINAL DECISION RESTS WITH THE AATCC PUBLICATIONS COMMITTEE. However, most papers will be acceptable provided they conform in content and layout to established practices of AATCC.

NOTICE TO AUTHORS OF PAPERS

MANUSCRIPTS for the *Proceedings* and for other publications of the American Association of Textile Chemists and Colorists shall conform to the requirements and standards given in this *Notice*. Before publication, manuscripts for the *Proceedings* shall be approved by the Editor, not only for editorial correctness according to the standards of this *Notice*, but also for content of technical matter. In his work, the Editor may enlist the aid of anonymous reviewers who are selected for expert knowledge in particular fields.

It is presumed that authors in studying the comments of reviewers and of the Editor will remember that all recommendations are made in a kindly, helpful, sympathetic manner to improve the paper in both literary and technical excellence. Although authors should cheerfully consider suggestions, they are expected to defend their position if justified, especially when strictly technical matters are involved with which the authors have an intimate knowledge.

AATCC strives to maintain a high scientific and professional standard for papers. Authors must make every effort to avoid the use of trade names, commercial products or process names wherever such use may be construed as advertising. Wherever possible, scientific nomenclature must be employed. For example, Part I designations in the new *Colour Index* should be used in place of dyestuff trade names. It is recognized that in some instances trade names are necessary to avoid lengthy description. Certain trade names have been so widely used as to become generic and these normally are permissible. Further, some technical papers may involve the presentation of a new product or process wherein trade name reference is obligatory.

Giving due consideration to such valid exceptions, it is incumbent upon the author to maintain the proper scientific attitude, avoiding any expressions or devices aimed at promoting a particular product or process.

Questionable papers are to be referred to the chairman of the Publications Committee, who will submit them to an editorial board which would be appointed as needed. The Board would report to the Publications Committee, which would have the final voice in accepting or rejecting a paper.

MANUSCRIPTS — Manuscripts shall be typewritten double-spaced with approximately one-inch margins on 8.5x11-inch white paper. In addition to the *original*, at least one carbon copy is required. Pages are to be numbered consecutively with Arabic numerals, and each page after the first shall carry the authorship at the very top. Tables and figures shall also be numbered consecutively, the tables with headings containing Roman numerals as TABLE I, TABLE II, etc, and the figures with Arabic numerals as **Figure 1, Figure 2, etc,** appearing *below* the figures. The names of the authors and their laboratories or business connections should appear below the title of the paper.

LITERARY STYLE AND FORM OF PRESENTATION—In the writing of papers, authors are requested to observe a trenchant, simple style of writing directed to textile chemists and colorists with at least an elementary knowledge of chemistry, physics, mathematics, engineering, textile processes and textile machinery.

In the organization of the material, there should be one or more introductory paragraphs setting forth the occasion, significance and main objectives of the paper and of the method of attack. This should be followed by the body of the presentation, either with discussions interspersed throughout this portion or with a collected section marked "DISCUSSION" after the main body of the paper. Finally, there may be a brief section at the end entitled "SUMMARY" or "CONCLUSIONS."

Center and side headings make for easier reading. Center headings should be employed sparingly and generally will include only very important section headings, such as "INTRODUCTION," "EXPERIMENTAL," "DISCUSSION," "CONCLUSIONS," "SUMMARY," and "REFERENCES." Side headings (see sixth paragraph of this *Notice* for an example) shall be indented and run into the text to which they apply, and shall be separated from the paragraph by a dash. The publisher will print center headings in bold-face capitals and side headings in capitals.

LITERATURE REFERENCES AND FOOTNOTES—References to the literature and all footnotes (except those in tables) shall be numbered consecutively with underlined Arabic numerals in parentheses at the proper place in the text. Where a reference or footnote is to be used again, the original number is simply repeated: this obviates the necessity of repeating the footnote or reference at the bottom of the page. Reference to the literature shall conform to the universal usages followed by *Chemical Abstracts*, which include underlining of journal names to indicate italicization in printing. The abbreviated codes for many journal names appear on page 145 of the 1956 *Year Book*.

The spelling and rules of punctuation followed in manuscripts shall be those found in the "Merriam-Webster New International Dictionary"; abbreviations and chemical formulas shall conform to *Chemical Abstracts*.

FIGURE AND GRAPHS—Figures and graphs should be black line drawings on white drawing paper. Photographic prints are acceptable, preferably glossy prints on double-weight paper. Duplicates should be available for dispatch to reviewers. In graphs, the frame and actual curves should be inked more heavily than the co-ordinate lines, and these latter should not be too close together. Various styles of broken lines are sometimes desirable to distinguish curves. Experimental points should be given with small plane figures, such as circles, squares, diamonds or triangles. Numbers and legends on co-ordinate axes are to be lettered in the graph by the author. Numbers and titles of figures should be placed below the diagram or on the edge of the back. Each piece of illustration copy should bear on the margin or on the edge of the back the name of the author and the title of the paper.

SYNOPSIS—A separately written synopsis of not over 200 words containing the gist of the subject matter must accompany every manuscript.

REPRINTS — Fifty overrun copies of papers published in the *Proceedings* will be furnished without charge by the publisher if requested when galley proofs are returned. These are printed on one side of the sheet only and then stapled together. A schedule of prices of reprints in the usual form accompanies the galley proofs, which will be sent to the author before publication.

OWNERSHIP OF COPYRIGHTS AND PATENTS—All papers presented at general meetings of the Association or at meetings of any of its local sections and all communications shall become the property of the Association. Such papers are not to be published elsewhere until they have appeared in the *Proceedings* of the Association. Papers published in the *Proceedings* are copyrighted by the Association. Any patentable disclosures shall of course remain the property of the author or authors.

TRADEMARKS—As the AATCC wishes to co-operate in the protection of trademarks, it is requested that, in the body of the article, trademarks be written with an initial capital letter.

Abstracts

New Polyester Fiber: Kodel

Anon, *Modern Textiles* **29**, 31, Oct, 1958.

A new polyester fiber, Kodel, said to be unlike any other, has been introduced by Eastman Chemical Products, Inc.

Garments made of Kodel, blended in proper proportions with other fibers, are said to have "a remarkable ability to stay fresh and neat in appearance because they have less tendency to muss and wrinkle."

Among the advantages claimed for Kodel are outstanding resistance to pilling; high resistance to heat; dimensional stability without heat-setting or special processing; good covering power; natural whiteness; ready dyeability; excellent performance on all three spinning systems and on conventional production and dyeing equipment.

The physical properties of the Kodel fiber, as cited by Eastman, include a tensile strength averaging 2.7 gpd; modulus of elasticity about 30 gpd; moisture absorption about 0.2%; and high resilience, ie, work recovery, from a 2% extension cycle, about 94%; from 5%, about 55%; and from 10%, about 35%. The sp gr is 1.22. Elongation at break has an average value of 27%.

Kodel is not affected by acids or alkalis normally encountered, and it has good resistance to common solvents and drycleaning agents. Resistance to weathering is good. With regard to flammability, Kodel will burn slowly, but melts and drops off when hanging free.

Fabrics made of Kodel may be ironed at 425°F. Fiber shrinkage in boiling water is less than one percent.

Production of the new fiber in staple form has already progressed beyond the pilot plant stage.

What's Happening to Man-made Fibers

Anon, *Textile World* **108**, 45-6, Sept, 1958.

The author reviews a large number of new fibers which have been announced during the last 12 months. Some are already in production; others are still in the experimental stage.

Tennessee Eastman is producing a polyester fiber, T-900, in staple form in its pilot plant. Commercial quantities are expected soon. Polyester fibers are now being made in nine different countries, as well as in the US.

Courtaulds has introduced two cross-linked cellulosic fibers, Corval and Topel, recommended mostly for blending with other fibers. They may be dyed with normal dyestuffs used for cellulosics. (See also *ADR* **47**, 598).

Du Pont has announced Fiber K, a synthetic elastomer which is said to possess high elongation, good recovery and good flex life. Du Pont has also introduced a one-denier Orlon fiber, particularly for sweaters, and an Orlon with 38-40% shrinkage, for extra bulking action.

Reeves Bros announced a polypropylene fiber of unusually high tensile strength, which shows promise for use in outdoor fabrics. This firm has also improved its polyethylene yarns, which have greater breaking strength and less degradation in sunlight.

American Bemberg has developed several nubby yarns for dress goods, sportswear, etc. These yarns are made in solution-dyed colors. Another Bemberg yarn, Parfe, has color applied at irregular intervals along its length. The dyes are said to have extreme fastness to light and washing. Still another Bemberg yarn has short dye-resist spaces at irregular intervals. If the yarn is dyed with direct colors, these spaces remain undyed.

Bakelite Co has introduced two low-pressure high-density polyethylene yarns, said to have excellent elongation and colorability and high tensile strength.

National Plastics Products Co has a low-density saran monofilament of high tensile strength and excellent light stability.

Firestone Plastics Co is making an 840-den 140-filament nylon, for use primarily in ropes.

American Viscose Co has introduced Avicron, a filament rayon yarn that may be permanently crimped and has interest in rugs, carpets, etc. The same firm also introduced eight solution-dyed shades of Super L yarn. Its Super Rayflex yarn is said to be 50% stronger than previous cord yarns.

American Enka Corp has a 70-den nylon 6 yarn, made specially for texturing, which is claimed to have greater dye receptivity than nylon 66.

Finally, Eastman Chemical Products has a new continuous filament yarn in which white fibers are combined with Chromspun fibers to produce heather effects for carpets.

Modifying Mechanical Properties of Cotton

Conrad, C M, *Dyer* **120**, 457-8, Sept 26, 1958.

This paper is a review of various chemical modifications of the cotton fiber which have been developed, with the object of improving its mechanical and other properties so as to meet the challenge of the synthetic fibers and enable cotton to compete in specialty markets. The following modifications are discussed:

Acetylation, an esterification reaction between acetic anhydride and one or more of the three hydroxyl groups of the anydride glucose units of the cellulose chain.

Cyanoethylation, a vinyl-type reaction between acrylonitrile and one or more of the cellulose hydroxyls.

Carboxymethylation, an etherification reaction which results when cotton padded with monochloracetic acid is brought into contact with strong sodium hydroxide.

Benzylation, produced by padding cotton with strong sodium hydroxide and bringing it into contact with benzyl chloride at high temperatures.

The breaking strengths of cotton fibers, yarns and fabrics show a variable response to chemical modification. Fibers more often than not lose strength; however, carboxymethylation at very low substitution considerably improves it. The strength of coarse, low-twist ply yarns, as well as sheeting and print cloth, is usually increased, while that of high-twist yarns is usually reduced.

Tearing strength of fabrics is reduced by all modifications tried, except carboxymethylation, which improves it materially.

Cyanoethylation reduces the knot strength of sewing thread about 15 percent.

The tensile stiffness of cotton fibers and of two-ply yarns is generally increased by chemical modification, and the toughness of the fibers is reduced considerably (carboxymethylation is an exception). Also with this exception, all the above chemical modifications have greatly reduced resistance to flex abrasion. On the other hand, chemical modification usually improves flat abrasion resistance greatly, and in the case of cyanoethylation, it is improved by over 70 percent.

Pilling: Causes, Methods of Control, and Testing

Brunnschweiler, E, *Ciba Rev* #128, 34-6, Sept, 1958.

"Pilling" denotes the formation of bundles of entagled fibers or "pills" on fabric surfaces as the result of a continuous mild rubbing or abrasive action. The phenomenon has always been observed in light-weight, lofty fabrics made from wool, spun viscose, or even cotton. In the past few years it has attracted particular notice owing to the current trend in the knitwear trade towards the production of loftier goods and owing to the use of looser constructions in woven fabrics.

In the process of pill formation some fibers in the garment, when subjected to wear, work their way to the surface of yarn and fabric to form a nap. Rubbing and abrasion promote and intensify the process. The projecting fibers then become entangled and felted, forming distinct heads or "pills" anchored to the fabric surface by a few connecting fibers.

The composition of the pills depends on the fiber content of the material. Pills of 100% wool, spun viscose, or cotton contain mechanically damaged fibers. Destructive abrasion progresses rapidly and the fibers break off. Hence pilling is usually less evident with such weak fibers. Pills from synthetic fibers, however, cling persistently to the fabric base because of their high tenacity, flexural strength and abrasion resistance, and hardly rub off at all in wear.

The author offers a number of suggestions for reducing the pilling tendency, including the following:

Smooth cylindrical-shaped fibers are more apt to work their way to the fabric surface than fibers with profiled cross-sections.

Coarse-denier fibers are less prone to pilling than fine deniers, and greater length of staple and a low crimp rate lessen the pilling tendency.

Two-ply and multi-ply yarns show better behavior than single yarns, and plain weaves show less pill formation than twills involving floats. Tightly woven or knitted fabrics are preferable to those of looser construction.

Goods which tend to pill can be much improved by proper finishing treatment, which is discussed at some length.

The author suggests several methods of testing fabrics for pilling tendency, all based on rubbing treatments, and describes standard procedures adopted for this purpose in Germany and Switzerland.

The Dyeing of Cellulose Acetate with Disperse Dyes. A Comparison with their Solubility in Organic Solvents.

Bird, C. L. *J Soc Dyers Col* 74, 688-73, Oct, 1958.

The well-known parallel between the solubility of disperse dyes in certain organic solvents and their suitability for dyeing secondary cellulose acetate has been examined by the author.

According to Mellor & Olpin, "Solubility in esters such as ethyl acetate is a reliable guide to the probable behavior of a dye towards acetate rayon."

In order to determine whether there is an exact parallel between solubility in cellulose acetate and in ethyl acetate, the author determined the solubilities of a large number of disperse dyes in ethyl acetate and other solvents, and compared them with the calculated solubilities of these dyes in secondary cellulose acetate. The results are given in tabular form. The other solvents included were ethanol, benzene, 20% aqueous ethyl acetate/ethanol (60:40), and 20% aqueous diethylene glycol diacetate (which has an acetyl value similar to that of secondary cellulose acetate).

It was found that with one exception the solubilities in ethanol shown in the table are much lower than those in secondary cellulose acetate. The solubilities in benzene (with two exceptions) are even lower. The solubilities in ethyl acetate, while an improvement on those in ethanol or benzene, are still not a very reliable guide. However, the author points out that secondary cellulose acetate contains both acetate and hydroxyl groups, so for comparison a mixture of ethyl acetate and ethanol should be used. Further, addition of water to the solvent, with most dyes tested, definitely improves the correlation with solubility in secondary cellulose acetate; the two aqueous solvents mentioned above appear to be equally satisfactory.

The author gives full details of the experimental work involved, and discusses the theoretical aspects. Nine references to the literature are cited.

The Application of Spot Tests in the Examination of Synthetic Fibers—Part 1

Feigl, F, Gentil, V, and Jungreis, E, *Textile Research J* 28, 892-4, Oct, 1958.

The authors have undertaken the development of new micromethod for the identification of synthetic fibers. This paper is the first report of their findings.

Since some synthetic fibers contain nitrogen while others are free of this element, a test for nitrogen obviously provides a means of distinguishing between these classes. Nitrogen can be detected without fail in organic compounds by a new micro test. The basis of this test is that all organic (also inorganic) compounds of nitrogen yield nitrous acid when heated with ignited manganese dioxide. The test is conducted in a micro test tube which projects through a perforated sheet of asbestos. A little of the specimen is placed in the test tube and intimately mixed with about 0.2 g of MnO_2 or Mn_2O_3. The mouth of the test tube is covered with a disk of filter paper moistened with Griess reagent (sulfanilic acid and 1-naphthylamine in acetic acid), and the bottom of the tube is strongly heated with a micro flame. If nitrogen is present, a red or pink circle develops on the paper.

For the characterization of acrylonitrile fibers a new test for aliphatic and aromatic cyanides (nitriles) can be used. This test is based on the fact that volatile thiocyanic acid is split off when aliphatic and aromatic cyanides are strongly heated with sulfur. Thiocyanic acid can readily be identified with great sensitivity by the well-known color reaction with ferric salts. The test is conducted in a similar manner to the preceding one. The tube, containing the fibers and sulfur, is covered with filter paper moistened with acidified ferric chloride solution. On heating with a micro flame, a deep red circle on the paper indicates presence of thiocyanic acid.

Those acrylonitrile fibers which contain acrylamide may be identified by their reaction with Rhodamine B, either the red aq solution or the colorless benzene solution. In both cases the fibers are colored an intense red. This test, like the others, may be performed in a micro test tube.

Thirteen references to the literature are cited.

General Calendar

AMERICAN ASSOCIATION OF TEXTILE TECHNOLOGY
Jan 7, Feb 4, Mar 4, Apr 1 (Della Robbia Room, Hotel Vanderbilt, New York, NY)

AMERICAN COTTON MANUFACTURERS INSTITUTE
Mar 19-21 (Annual Convention — Palm Beach Biltmore Hotel, Palm Beach, Fla)

AMERICAN OIL CHEMISTS SOCIETY
April 20-22, 1959 (Roosevelt Hotel, New Orleans, La; Sept 28-30, 1959 (Statler Hotel, Los Angeles, Calif)

CANADIAN ASSOCIATION OF TEXTILE COLOURISTS AND CHEMISTS (QUEBEC SECTION)
Jan 30 (joint meeting with Textile Society of Canada Eastern Div, Ritz Carlton Hotel, Montreal); Feb 21, Mar 21, Apr 18 (McGill Univ, Montreal, Que); June 20 (Annual Golf Tournament)

THE FIBER SOCIETY
April 29-30 (Fontana Village, NC)

SYNTHETIC ORGANIC CHEMICAL MANUFACTURERS ASSOCIATION OF THE UNITED STATES
Jan 13, Feb 10, March 11 (Luncheon meetings at the Hotel Roosevelt, New York, NY)

News of the Trade

SOCMA Announces Expanded Committees and Increased Activities

Citing the disappearance of the word "selective" from the Administration's recent request for tariff cutting powers as one of the prime reasons for the move, the Synthetic Organic Chemical Manufacturers Association last month announced plans to reorganize and expand its Committee operation to an unprecedented degree, and thereby to increase SOCMA's activities to a far wider scope in the field of foreign trade legislation and administration.

New legislation, it was explained, already has caused, and the inevitable to-be-proposed tangent legislation will cause, conditions that are different from those with which the Association has been working in recent years. It was declared vital to the industry that SOCMA take immediate additional steps to defend the domestic scientific field of organic chemistry. This will be accomplished primarily, it was pointed out, through expanded activities of existing subcommittees and newly created specialized subcommittees of the Association's International Commercial Relations Committee, chairmanned by Paul K Lawrence.

Among the new subcommittees is one which will keep the Association fully informed on significant developments in the European Common Market, or Free Trade Areas. Another will cooperate actively with the industry on escape clause and anti-dumping proceedings, while a third will attempt to document and combat cases of discrimination or unfair treatment of US exports by foreign countries.

In view of growing reports that goods originating in Iron Curtain countries are being nationalized in most favored nation countries and subsequently imported into the domestic U S market, the Association has created a new subcommittee to explore this situation. A further area with which this subcommittee may be concerned is the problem of trade from the United States to Iron Curtain Countries.

Another new subcommittee will have the task of presenting SOCMA's views in any trade agreement negotiations, and, since peril point investigations are a preliminary to negotiations, the subcommittee will also cover this phase of activity. A specialized tariff legislation subcommittee will take over the broad field of all legislation bearing on tariffs.

The work of the International Cooperation Administration subcommittee will be to discuss with government agencies adequate procedures for ensuring domestic organic chemical producers a fair and equal opportunity to bid on chemicals purchased as part of the off-shore procurement program. A final new subcommittee will monitor plans for and activities of the General Agreement on Tariffs and Trade (GATT).

Four subcommittees of the International Commercial Relations Committee which have been active in the past will remain as a part of the overall operation. These are the subcommittees on Customs Matters, National Defense, the Revision of Tariff Act Schedules, and Technical Advice.

The reorganization, reassignments, and expansion have already been approved by the SOCMA board of governors and have gone into effect.

Jefferson Ethylene Plant On Stream

A new ethylene plant, first of several units to be completed as part of a major expansion program of Jefferson Chemical Company, Inc, has gone on stream at Port Neches, Texas. The new unit reportedly will triple the company's production capacity for ethylene. In addition, the over-all expansion will double the plant's capacity for ethylene glycol, increase by 50% the production of ethylene oxide, and permit Jefferson's entry into new fields based on ethylene and propylene, it is reported.

Within the next month, the second unit of the program will be completed. This is a direct oxidation plant for production of ethylene oxide. Later on, a chlorine-caustic unit will be completed along with an ethylene glycol plant. Completing the expansion, in the early Summer, will be propylene glycol and propylene oxide units.

Red-Ray Names Met Representative

The Red-Ray Mfg Co, Inc, Cliffside Park, NJ, manufacturers of radiant (infra-red) gas burners, has announced the appointment of the A N Mason Co, 30 S Broadway, Yonkers, NY, as its representative in the Metropolitan New York-New Jersey area.

Formation of United Ultramarine & Chemical Company Announced

The formation of a new corporation, United Ultramarine & Chemical Co, Inc, has been announced by William F Siemon Jr, executive vice president of the company. With executive offices at 149 Broadway, New York, NY, and sales agents and warehousing throughout the United States and Canada, it will market a full range of Ultramarine Blue pigments and allied chemicals manufactured by the parent company, Vereinigte Ultramarin Fabriken A G of Cologne, Germany.

For the past several years, since ceasing its own manufacture of the pigment, American Cyanamid Co reportedly has been supplying the North American market with Ultramarine Blue made by Vereinigte Ultramarin Fabriken. In line with a current policy of concentrating efforts on products of its own manufacture, the Pigments Division of Cyanamid has discontinued the resale of Ultramarine Blue.

President of United Ultramarine & Chemical Co is Otto C Leverkus, a managing director of Vereinigte in Germany. C Erwin Leverkus, of the German firm, is chairman of the board. In addition to Mr Siemon, the remaining two directors are W Topken and R Koch-Weser of the New York law firm of Topken & Farley.

Vereinigte Ultramarin Fabriken, in addition to ownership of United Ultramarine & Chemical Co, operates a 50% American-owned chemical company in Cologne, Deutsche Advance Produktion GmbH.

Metro-Atlantic Opens NY Merchandising Office

Metro-Atlantic, Inc, Centredale, RI, has opened new merchandising and promotional offices at 6 East 39th Street, New York, NY, which will enable Edward F Starke, director of merchandising, to provide improved service.

Facilities have been provided to show in detail the benefits to be derived from use of the Ranedare water-repellent program. New developments for treating textiles with nonchlorine - retentive resins and wash-and-wear finishes will also be on display.

Johnson's Wax to Sell Specialty Chemicals

Johnson's Wax has announced a full-scale plan to enter the specialty chemicals field as basic supplier of diphenolic acid, which Johnson's will sell under the trademark "DPA."

According to W H Keland, manager of the DPA Enterprise for Johnson's Wax, DPA has a high potential for producing interesting new chemical materials and improving the quality of established products in a wide variety of industries. These include use as a raw material and additive for textile chemicals, polymers and coating compositions, synthetic detergents and emulsifiers, lubricating agents, oxidation-corrosion inhibitors, flame retardants, etc.

The new venture is a decided switch on the usual move of basic suppliers into direct-to-consumer selling. It was prompted by the research work of S O Greenlee, a former member of the Johnson's Wax research and development staff. Dr Greenlee is noted for his work in the epoxy resin field.

Keland pointed out that his company has had considerable experience in chemical processing, such as making polymers for its own products, even though it has not sold them to other companies. Johnson's Wax has for many years supported extensive basic and applied research facilities in chemical and allied fields. He said the potential availability of the raw materials for DPA in quantity and at a reasonable price made entry into the new field particularly attractive.

The company has capacity for introductory samples and test quantities of the new chemical. It will take approximately 12 months to prepare production facilities and during this time intensive market development will continue. This activity is being coordinated by C J Bown, market development engineer for the Johnson's Wax DPA Enterprise.

CMRA Schedules Meeting on Textile Chemicals

Chemicals for the textile industry will be the subject of the next meeting of the Chemical Market Research Association, to be held February 18 and 19 at the Dinkler Plaza Hotel, Atlanta.

Present and future markets for textile chemicals will be outlined in the scheduled talks and discussion, which will describe the total role of chemicals in modern textile technology.

Para-Chem Names Southern Rep

Para-Chem, Inc, Philadelphia, Pa, recently announced the appointment of Ralph Gossett and Co as southern representatives for the sale and distribution of Para-Chem products throughout the southern territory.

Ralph Gossett and Co offers service of textile supplies, textile machinery and yarn. Its addition of the Para-Chem, Inc line of latex compounds, sold under the trade name Paranol, marks the Company's entry into the textile wet-processing field.

Both John W Jordan, Para-Chem president, and Ralph Gossett Jr feel that the new association will give Para-Chem far greater sales coverage in the territory, which the Philadelphia concern will assist with technical service provided by its laboratories. Assisting the seven Gossett salesmen as technical adviser will be Para-Chem's James E Kerr, who has been active for the past ten years in the latex compounding business and is well versed in all types of latex applications.

Kaplan, Temp-Resisto Adopt Eastman Plan

Samuel Kaplan & Sons and Temp-Resisto Fabrics have completed negotiations with dyers in the area to have the two firms' entire spring line of insulated and uninsulated piece-dyed acetate fabrics tested for resistance to gas fading under the new Eastman Plan for Specification Dyeing. The plan, devised by Eastman Chemical Products, Inc, subsidiary of Eastman Kodak Co, is designed to make it possible for converters to assure themselves and their customers through laboratory tests that acetate fabrics dyed for them meet specified colorfastness requirements.

Kaplan and Temp-Resisto intend to promote their spring lines of fabrics extensively with advertising, literature and other customer aids. Special tags will be furnished manufacturers highlighting the features of the linings including both the story of the Eastman Plan and the fact that such linings are Cravenette-treated for improved spot and stain resistance.

Murray Kaplan, an executive for both firms, has stated that the fade-, stain- and spot-resistant features of the two firms' spring lines are being well received by several leading coat and suit manufacturers and chain organizations.

Samuel Kaplan & Sons is located at 209 W 38th St, New York, NY, and Temp-Resisto Fabrics is located at 35 8th St, Passaic, NJ.

Sherman to Discontinue Operations

The Geo E Sherman Co, Inc, Brooklyn, NY, has announced plans to discontinue operations after December 31, 1958. Established in 1905, the firm experienced rapid growth under the guidance of the founder, George E Sherman, and his three sons, William, Allen and Edwin. All played an important part in manufacturing and distributing a range of chemical specialties to dyeing and finishing plants throughout New England, New Jersey, Pennsylvania and many Southern states. Originally specializing in the manufacture of soap, the company soon became an important supplier to many of the larger soap companies. With the advent of logwood dyes, they then expanded into the field of dyestuffs and chemical specialties. More recently a line of water-phase pigments was developed for the printing industry.

In 1931 a Southern Branch manufacturing plant was established in High Point, NC, achieving a reputation during the next 20 years as an important supplier to the hosiery mills in that area.

A new organization, Crestco Chemical Co, Inc is being formed to engage in an active program of product development for the textile wet-processing industry. It is planned to manufacture a diversified line of chemicals with Richard B Simon as sales manager. Mr Simon has had experience with Allied Printers, Burlington Mills and Stafford Printers as well as with the original Sherman company. He will be assisted by John E Sherman, while the New York plant operations will be under the direction of Allen C Sherman Jr.

Wyandotte Splits Engineering and Research Staffs

Wyandotte Chemicals Corp Wyandotte, Mich, has announced a reorganization of its Research and Engineering Division into two new staff divisons—Research Division and Engineering and Development Division.

J Willam Zabor, who had headed the research activity of the former combined division, becomes director of the Research Division, and John H Reifel, who has been director of the development activity of the former division, becomes director of the Engineering and Development Division.

Both division heads will report to President Robert B Semple.

NC State Establishes Radiological Lab

"An extremely powerful research tool" was added to the textile industry last month when the School of Textiles at North Carolina State College, Raleigh, NC, announced establishment of a $96,000 radiological laboratory at its Research Center. William A Newell, director of the Textile Research Center, reported that the Atomic Energy Commission will support research at the laboratory over a three-year period.

The total project is expected to cost approximately $275,000 with the AEC supplying 80 percent of the funds. The college has begun negotiations with four major textile firms for the remaining 20 percent of the cost.

The laboratory will be used for teaching and research in industrial radiation, specializing in fibers and textile manufacturing. Scientists will study what happens to fibers exposed to nuclear radiation.

Mr Newell said that a shipment of highly-radioactive cobalt-60, supplied by Atomic Energy of Canada, Ltd, was being sent to the college. The cobalt shipment and its lead shielding weighs 8,000 pounds and contains 2,300 curies of cobalt-60. Total value of the shipment is $24,000. This amount of cobalt-60 reportedly will, when new, produce 85 quadrillion gamma rays per second. It will be the only gamma source at State College and will be used in the laboratory to bombard textile materials under study in the Research Center.

The Atomic Energy Commission's interest in the project, Mr Newell explained, is to find industrial use for radioactive materials created by the giant nuclear reactors being constructed in this country to provide electric power. He compared these radioactive substances to ashes and clinkers taken from a furnace. They must be disposed of, he said, and the AEC is seeking ways to put them to industrial use.

The proposed study will cover four areas of potential applications at State College. They are:

1) Modification of fiber properties by irradiation.

2) Modification of fiber and fabric properties by polymerization of finish monomers by radiation.

3) Use of beta gauges for measurement and control of textile processes.

4) Use of radioisotopes as tracers, and employment of activation-analysis techniques in textile processing.

As an example of how such studies can be of help to textile mills, Mr Newell explained that, at present, resin is applied to fabric to produce a wash-and-wear finish, using heat and acid. This method degrades the fabric somewhat. If the resin could be applied through use of radioactive materials, this degradation would be eliminated.

He explained that, by exposing fibers to nuclear radiation, unusual transformation in molecular structure can be brought about. Some physical properties can be altered to improve an end product, and studies can be made involving measurements or tracing on a production basis.

"These techniques," Mr Newell explained, "can be useful in studying blending efficiency, amount of uniformity of wet pickup, studies of wear or corrosion, identification of products, and in abbreviating many lengthy analytical techniques."

In addition to Mr Newell, principals in the radiological research activity include Malcolm E Campbell, dean of the School of Textiles, Henry A Rutherford, director of chemical research, and Otto Teszler, head of radiological research.

The $96,000 laboratory, designed by Mr Teszler, is comprised of offices, a decontamination room, counting room, waste-disposal area, and a large research laboratory. The research laboratory is divided into an application area into which full-sized equipment can be brought for use in projects; an area in which isotopes can be handled under optimum safety conditions; and a high-level radiation laboratory which houses a self-contained multi-kilocurie gamma source. Total floor space is 1,825 square feet.

Mr Newell said the laboratory "is the largest and best equipped facility of its type in the textile industry. The textile and allied industries now have at their dispósal one of the finest radiological laboratories in the world —designed and staffed exclusively for exploration of the potential benefits of applications of nuclear radiation and radioactive isotopes to textile materials and processes. It is an extremely powerful research tool."

US Testing and American Bemberg to Cooperate on W&W Control Program

With the development of several wash-and-wear finishes for the highly popular cotton and Cupioni fabric blends, the United States Testing Company, in cooperation with American Bemberg, creator of the Cupioni yarn, has announced a program of quality control for the protection of the trade and the consumer.

Before an officially identified cotton and Cupioni blend is authorized to display the wash-and-wear seal of the US Testing Co, it must be tested under the new wash-and-wear standards of the Company. The fabric will be tested for wrinkling tendency, wrinkle recovery, puckering tendency, and crease resistance under standardized laundering procedures based upon accepted consumer practices. Due consideration will be given to the fabric's color and dimensional stability and its durability, it is stated.

However, in view of the fact that it is expected that over 35,000,000 garments of widely different types and qualities will be made of cotton and Cupioni blends during 1959, US Testing Co and American Bemberg have set up a program for the testing of the garments themselves. Such factors as seams, tapes, linings, and accessories will be evaluated. Only those garments that receive the approval of the laboratory will be permitted to feature the wash-and-wear seal.

All manufacturers using approved wash-and-wear Cupioni blends will be entitled to submit their garments for test and approval under the new quality-control program. Garments will be evaluated under the method developed by US Testing Co, which employs a Tachistoscope used in psychometric testing. The wash-and-wear products are rated in a viewing box under controlled lighting conditions and are rated for effectiveness or ineffectiveness, as well as for degrees of effectiveness.

Carbon Bisulfide Plant Begun in Italy

Ground has been broken at Varedo, near Milan, Italy, for Europe's largest carbon bisulfide plant. The plant is being built by Snia Viscosa using a new carbon bisulfide process developed and licensed by Food Machinery and Chemical Corp. Completion of the plant is expected in 1960, with output to go chiefly to the rayon industry. In announcing construction of the new plant, spokesmen for the two companies noted that the European Common Market provides a very favorable outlook for a plant of this size, which will be several times bigger than the next largest in Europe.

FMC's carbon bisulfide process, in use in this country at the Company's South Charleston, W Va plant, is of the continuous, petrochemical type, and will use the natural gas abundant in Northern Italy. Licensed now for the first time in Europe, it is being made available to Snia on a royalty basis.

• NAMES IN THE NEWS •

Baker

Reed

Rose

McIver

Samuel G Baker, general manager of the Organic Chemicals Department of E I duPont de Nemours & Co, Inc, was elected president of the Synthetic Organic Chemical Manufacturers Association at its 37th annual meeting, held earlier this month at the Roosevelt Hotel, New York. The Association represents manufacturers of 90% of the domestic production of commercially marketed synthetic organic chemicals.

Carl A Gerstacker, vice president & treasurer, Dow Chemical Co, was elected first vice president of the Association, and **Chester M Brown,** president, National Aniline Div, Allied Chemical Corp, was elected second vice president.

James A Singmaster Jr, Eastern Regional sales manager, Monsanto Chemical Co, was elected treasurer of the Association for 1959, while **C Kenneth Egeler,** Eastern manager, Sherwin-Williams Co, and **Thomas C Keeling Jr,** general manager, Chemicals & Dyestuffs Div, Koppers Co, Inc, were elected new members of the board of governors.

Elvin H Killheffer and **August Merz,** past presidents of the SOCMA, were reelected honorary members of the board for one-year terms.

Hubert A DesMarais has been appointed Southern sales manager for Francolor Inc with headquarters in Rock Hill, SC, from which point he will be responsible for Francolor sales in Georgia, the Carolinas, and Virginia.

Arrangements are now being made for stocks to be carried in Francolor's Southern location and imports are being made through the port of Norfolk, Va.

Mr DesMarais' most recent association was with the Southern office of Verona-Pharma Chemical Co. Prior to that time, he had managed General Dyestuff Co's Pacific Coast branch for 20 years.

Firmin P Reed has been elected executive vice president of Arnold, Hoffman & Co, Inc by vote of the firm's board of directors.

Dr Reed joined Ahco as research director in 1954 and was elected technical vice president and a director in 1955. Prior to joining Arnold, Hoffman, his entire business career, apart from two years with the Control Commission in Germany, had been spent with ICI in various research and production departments.

Ahco has announced also the appointment of **John T Rose** to the position of branch sales manager of the company's Charlotte, NC sales office. He was formerly Ahco's sales representative serving paper and textile accounts in the South, and prior to that was employed by Fieldcrest Mills, Monsanto Chemical Co, and the DuPont Co.

Election of **Israel L Sonenshein** as vice president of Atlantic Chemical Industries, Inc, Passaic, NJ, was announced Dec 2.

Atlantic Chemical Industries, Inc is the parent company of a group of organic chemical manufacturers with plants in Nutley, Plainfield and Matawan, NJ, producing intermediates, dyestuffs, polystyrene plastics and fine organic chemicals.

Mr Sonenshein, who has been general manager of the firm since 1953, had previously served as a Government attorney for eleven years, with his last position that of chief counsel to four branches of the Office of Price Stabilization.

Walter H Hindle, formerly director of Applications Research at Chemstrand Corporation, has joined Air Reduction Company, Inc, as consultant in connection with Airco's investigation of polyvinyl alcohol fiber. Mr Hindle was recently awarded a diploma as a fellow of The Textile Institute, Manchester, England.

Retirement of **Daniel McIver** as secretary-treasurer of the Original Bradford Soap Works, Inc, West Warwick, RI, has been announced by his son and company president, **Daniel R McIver.**

Allan H Howland, a vice president and director of the company, has been named to succeed Mr McIver as treasurer, while **Mrs Daniel R McIver** becomes secretary.

OBSW has announced also that **James S Brown,** long identified with the Rome Soap Co, Rome, NY, has joined the OBSW sales staff. In his new capacity, he will service all the accounts previously served by Rome Soap Co.

Daniel McIver joined the company in 1908, as one of the three incorporators, when it occupied a 20 x 25 ft building in Johnston, RI. It has occupied its present plant in West Warwick since 1931 and also has facilities in Canada and Greensboro, NC. One the country's oldest soap manufacturers, OBSW was formed in 1876 when two men from Bradford, England transferred operations to the United States.

H E Maurer has been appointed president and **Walter Lau** vice president of Progressive Color and Chemical Co, Inc, New York, a subsidiary of Intercontinental Chemical Corp, New York.

Progressive is a distributor of chemicals, intermediates and other products manufactured by Farbwerke Hoechst AG, Frankfurt-Hoechst, West Germany, as well as distributors of chemicals produced by Hoechst Chemical Corp, West Warwick, RI.

Aceto Chemical Co, Inc, Flushing, NY, has appointed **Daniel W Kallman** new products manager. Mr Kallman, a chemical engineer, has a broad background in the chemical industry, including many years in market research and development.

Mettee

The following recent personnel moves have been announced by American Cyanamid Co:

M H Mettee has been named sales manager of the dyes department, reporting to **J H Naylor**, manager. Mr Mettee, who will have overall responsibility for the marketing of all dye products of the company, was most recently manager of the intermediates department. His office will be in the dyes department headquarters at Bound Brook, NJ.

Martin B Friedman, assistant advertising manager of the Company's Organic Chemicals Div, will direct advertising and sales promotion for the dyes department in addition to supervising advertising and sales promotion efforts of the textile chemicals department. **Robert P Vivian** will execute details of the dyes department program, reporting to Mr Friedman.

Joan Butler, most recently associated with the Public Relations Division of Hazard Advertising Co, Inc as an account executive servicing the Cyanamid account, has been appointed product publicity supervisor for the Organic Chemicals and Pigments Divisions.

Leonard G Tompkins has been named technical manager for the petrochemicals department, succeeding **J C Pullman**, who has been appointed assistant to the Organic Chemicals Division's commercial development manager. Dr Tompkins has been associated with the market development department of the company since 1954.

Max Winkler has joined the Fibers Division as a technical service representative. Prior to joining Cyanamid, he was with American Viscose Corp for 13 years as assistant to the manager of the converting relations department. In his new post, Mr Winkler will report to **Robert J G Schofield**, technical service manager.

Leonard Frank, Lowell Technological Institute Class of 1961, has been awarded a substantial scholarship, sponsored by the National Aniline Division of the Allied Chemical Corporation.

Douglas C Newman, director of sales of Du Pont's Dyes and Chemicals Division, whose 40-year career has made him one of the best-known figures in the nation's dye industry, has elected to retire early next year.

William A Bours, III, director of sales of the Freon Products Division since 1957, has been named to succeed him. Mr Bours, in turn, is succeeded by **Carl S Oldach**, assistant director of the company's Development Department.

The new appointments became effective December 1. At company request, Mr Newman has agreed to remain as special assistant to the general management of the Organic Chemicals Department until the end of February.

Mr Newman joined Du Pont in 1918 as a textile colorist in the Technical Laboratory of the Organic Chemicals Department at Deepwater Point, NJ. He became a technical demonstrator in 1921 and the following year was transferred to the Providence, RI, office of the Dyestuffs Division as salesman and demonstrator. He was made assistant manager of the Charlotte, NC, office in 1927 and manager in 1943. He became sales manager of the southern district in 1946. In 1949, Mr Newman was transferred to Wilmington as assistant director of sales for the Dyestuffs Division and was appointed sales director in 1950. In 1951 he was named general director of sales activities of the Organic Chemicals Department, and in 1955 was appointed director of sales of the Dyes and Chemicals Division.

Born November 25, 1896, in Woodstock, Va, Mr Newman received his bachelor of arts degree from Randolph-Macon College, Ashland, Va, in 1917. Prior to going with Du Pont, he was with the Federal Dyestuff and Chemical Corp, Kingsport, Tenn.

Wrightson

Metro-Atlantic, Inc has announced the appointment of **Rhita Wrightson** to the newly created post of assistant technical director for the Southern Division, operating from the Greenville, SC laboratories. Mrs Wrightson has had 12 years' experience in finishing plants and technical service.

Cimma

Dino D Cimma has joined Geigy Dyestuffs, Division of Geigy Chemical Corp, to direct sales and technical services of Tinolite textile pigment colors. In his new capacity, Mr Cimma will become a member of Geigy's Textile Pigment Department with headquarters in Ardsley, NY.

Prior to joining Geigy, Mr Cimma was associated for seventeen years with the Textile Color Division of Interchemical Corp, holding various positions in product development, technical service and sales of pigmented emulsion systems for textile printing and dyeing.

Walter J Romaine has been appointed sales representative for the Textile Chemical Department of E F Drew & Co, Inc and will service the company's accounts in the New England area.

Mr Romaine was formerly associated with the Research Department of Shawinigan Resins Corp and with the Dyehouse Department of Belding Corticelli.

The appointment of **Jerome T Collins** in a sales merchandising capacity has been announced by Eastman Chemical Products, Inc.

Mr Collins' headquarters will be in New York, where he will act as Eastman liaison with the New York and Southern operations of major textile mills and coordinate his activities with the apparel and home furnishings merchandise managers. The post is a new one.

Previously a vice president of Mojud Company, Inc, Mr Collins has also been associated with J P Stevens & Co as sales manager of its Yarn Sales Division.

Joseph L Huckabee has been appointed technical sales representative of the Wallerstein Company, Inc's textile division in the Carolina and Virginia area.

He has been in the dyeing and finishing departments of Rock Hill Printing & Finishing Company, Rock Hill, SC, since 1951.

Zuber

Mackin

McClelland

Toner

Arvid V Zuber has joined the staff of the Textile Fibers Department, Union Carbide Chemicals Co Div of Union Carbide Corp.

Dr Zuber has been with Union Carbide since 1953, having been a project leader in the Corporation's Patent Department and more recently associated with the Contracts and Licenses Department of Union Carbide International Company.

He will make his headquarters in Union Carbide's Textile Fibers Department at 100 East 42nd Street, New York.

New appointments for **Clifton D Crosby** and **Robert H Hoffman** also have been announced by Carbide.

Mr Crosby, who was previously a market analyst in the Market Research Department, is promoted to assistant manager, sales analysis. In his new position, he will share the responsibilities for planning and developing improved sales analysis procedures.

Mr Hoffman, formerly a technical representative in the Newark District, is assigned to the Sales Analysis Department. In his new position, he will supervise the mechanical reproduction of sales analysis reports.

Appointment of **Brian Bamforth** as dyeing and bleaching consultant to American plants has been announced by The Longclose Engineering Co, Ltd. The new technical consultant will be attached to Atkinson, Haserick & Co, American sales representatives for the complete line of Longclose dyeing and bleaching machinery.

Mr Bamforth was previously employed by J & P Coats Ltd.

Robert E Baarson, in charge of the flotation research laboratory for the Chemical Division of Armour and Company, has been given the added responsibility of evaluating newly developed chemicals within the research department.

Mr Baarson's duties will include finding new uses for chemicals developed by the Organic Research Section.

Jinkerson

H J Mackin, New York City district manager for Goodyear Tire & Rubber Company's Industrial Products division since 1939, has been promoted to assistant manager, Eastern Region, retaining headquarters at New York.

B E McClelland has been moved up from assistant to manager of the division's New York City district and **H L Jinkerson**, a field representative at Cleveland, O, has been promoted to assistant manager at New York.

The firm's district operations at Boston are now being administered from the New York City office. **G M Landon** will serve the Boston district as field representative with administrative duties handled by the enlarged New York district office.

Canavi

Peter C Canavi has joined the Onyx Oil & Chemical Company as an enrollee in the company's training program. Formerly with Du Pont at the Chestnut Run location, Mr Canavi served as a chemist in that company's Textile Research Laboratory. He is begining his broad company training schedule in Onyx's Quality Control Department.

Richard K Toner has accepted the appointment of assistant editor of *Textile Research Journal*. Effective May 1, 1959, Professor Toner will assume the post of editor of **TRJ** and director of publications of the Textile Research Institute, replacing **Julian S Jacobs**, who is retiring from those posts after seventeen years with the Institute. Professor Toner has been a member of the faculty in the Department of Chemical Engineering of Princeton University since 1939. He has been a research associate of Textile Research Institute since 1944.

Allied Chemical Corp has announced the appointment of **Herbert W McNulty** as assistant manager of market research for its National Aniline Division and **John W Priesing** as West Coast sales representative for its Solvay Process Division.

Mr McNulty, who previously served as supervisor of market development for the Technical Division, Pennsalt Chemicals Corp, was a member of the Product-Development and Sales Departments of the Solvay Process Division from 1951 to 1956.

Mr Priesing, who is now located at Allied Chemical's Consolidated Sales Office in San Francisco, was formerly assigned to the Detroit sales branch.

Henry A Weil has rejoined the Chemstrand Corporation as a technical service specialist.

Weil was with Chemstrand for two years before he left in 1956 to become associate director of applications research for Sandoz, Inc, New York. He also has held previous positions with General Motors, Detroit; and National Aniline, New York.

A half century of association with the dyestuffs industry in Canada and Great Britain was recently observed in Montreal by **W H Hampshire**, dyestuffs supervisor of the chemicals division of Canadian Industries Limited.

To mark the occasion, Mr Hampshire's colleagues at C-I-L presented him with a 50th anniversary cake.

TECHNICAL LITERATURE

(Literature is available from sources shown in italics)

ANTARA CHEMICALS CATALOG—*Antara Chemicals, 435 Hudson St, New York 14, NY*———This 64-page, expanded and completely revised chemicals catalog describes the composition, properties and uses of Antara products.

For convenience, it is divided into separate sections devoted to surfactants, organic intermediates, acetylene derivatives, carbonyl iron powders, ethylene oxide and glycols and numerous specialty chemicals, including optical brighteners, ultra-violet light absorbers, etc.

ARMOUR FATTY ACIDS AND ALIPHATIC ORGANIC COMPOUNDS — *Armour & Co Chemical Div, 1355 W 31st St, Chicago 9, Ill*———Catalog lists products previously unavailable on a commercial scale, revised specifications and recently developed application suggestions.

The brochure identifies over 150 different products by name, specification and application in a condensed tabular form.

Chemical Division sales offices in 16 cities and two sales agents in three cities are also listed.

1958/1959 BUYERS GUIDE TO IMPORTED GERMAN PRODUCTS—$5.50; *German-American Trade Promotion Office, Suite 6900, Empire State Bldg, 350 Fifth Ave, New York 1, NY*———Features again three separate directories in one volume: Directory of German Export Manufacturers, Directory of US Importers, and the Classified Guide to Imported German Products, with a newly added product index. These directories tell the American buyer what industrial and consumer goods are available from Germany, who makes them and who sells them in the US. It is a complete reference volume on German-American trade.

CACHALOT BRAND FATTY ALCOHOLS—*M Michel & Co, Inc, 90 Broad St, New York 4, NY*———This new data sheet lists selected grades from a full line of C12 to C18 straight-chain aliphatic alcohols.

CHEMICAL PROCESS EQUIPMENT —*The Patterson-Kelley Co, Inc, East Stroudsburg, Pa*———Bulletin No. 16 contains product description and specifications for a complete line of blenders, vacuum tumble dryers, packaged resin-distillation pilot plants, and process heat exchangers.

The new 16-page bulletin also describes the organization and operation of the company's pre-test laboratory which, in testing customer formulations, helps determine proper blending equipment and correct blending procedures.

Using tables and simplified diagrams, the new bulletin lists standard dimensions and capacities for the patented Twin Shell intensifier blender; Liquid-Solids blender (laboratory and production models); and the yoke, cone, and ribbon-type blenders; plus vacuum tumble dryers in complete packaged units from one to 150 cubic foot working capacities; packaged resin-distillation pilot plants designed for research or small batch operation; and shell- and tube-type heat exchangers, including the company's Lever-Lock quick-opening door for use on straight-tube process heat exchangers and pressure vessels.

COMPILATION OF CHEMICAL PROCESSES IMPORTED BY JAPANESE—*$250.00, Chemonomics, Inc, 77 South St, Stamford, Conn*———A 50-page list of over 300 chemical processes imported by the Japanese over the past three years has been compiled in Japan by Chemonomics, Inc, which is now offering an English translation of this work.

The compilation covers the years 1955 through 1957 and includes synthetic fibers and textiles, petrochemicals, organic and inorganic chemicals, petroleum refining, ceramics, resins and rubber, metallurgy, pulp and paper. It provides information on the Japanese companies acquiring the processes, the specific processes acquired, the licensor and the date the license was granted. The cost of the licenses and the detailed capacities of the processes for petrochemicals are provided.

The data are designed to provide a picture of the situation to companies interested in determining potential Japanese competition on the world market from new processes; the potential market for American processes in Japan; and the availability of licenses on an international basis. It should also prove useful to international engineering companies interested in determining their share of the market in Japan.

CRE TENSILE TESTER BULLETIN —*Scott Testers, Inc, 63 Blackstone St, Providence, RI*———Six-page brochure describes entirely new Scott Constant-Rate-of-Extension Tensile Elongation Tester, with ultra-precise electric weighing, for stress-strain evaluation of all materials in the range 0-.05 lbs to 0-1,000 lbs or 0-25 grams to 0-500 kgs tensile. Features low cost due to radical design concept permitting basic tester tailored to user's application, with additional options to provide laboratory versatility, and over 150 Scott clamps and holding fixtures for conformance with ASTM and ISO methods.

CSI CATALOG No. 59—*Custom Scientific Instruments, Inc, Kearny, NJ*——Contains illustrations and brief descriptions of sixty different testers or equipment that CSI manufactures as standard products.

CURRENT TOPICS #136—*L Sonneborn Sons, Inc, 300 Fourth Ave, New York 10, NY*———Development of a new line of specially stabilized white oils that are said to have far greater resistance to discoloration due to heat than regular white oils is revealed in the latest issue of a series of bulletins published by the Department of Industrial Research of L Sonneborn Sons, Inc.

Known as Thermol White Oils, this new product line is available in Saybolt viscosities at 100° F, ranging from 70 to 350.

The Thermol White Oils, says the bulletin, can be used for many important industrial applications in which conventional white oils have darkened when exposed to heat. These include: textile sizings and miscellaneous chemical processing operations.

DIFFERENTIAL PRESSURE LEVEL TRANSMITTER MODEL 13D1460 SERIES—*Fischer & Porter Co, 764 Jacksonville Rd, Hatboro, Pa*———Information on a new line of F & P exclusive sealed-circuit force-balance differential pressure transmitters for level measurement is given in new Spec Sheet 13D1460.

DIMETHYL ETHERS—*Ansul Chemical Co, Chemical Products Dept, Marinette, Wis*———Discusses the physical and chemical properties, specifications, applications and suggested uses of Ansul ethers.

The tradenames of the four products are—E-121, dimethyl ether of ethylene glycol; E-141, dimethyl ether of diethylene glycol; E-161, dimethyl ether of triethylene glycol; and E-181, dimethyl ether of tetraethylene glycol.

The bibliography in the brochure lists 44 reference sources for additional information.

DURABLE MOTHPROOFING OF WOOL — NEW AND INEXPENSIVE METHODS USING DIELDRIN ——*Dept of Science and Technology, The Wool Bureau Inc, 16 West 46th St, New York 36, NY*———The newest process for combatting the clothes moth and the carpet beetle, which contribute much to the $500 million fabric damage by insects in this country each year, is the subject of this technical brochure published by the Wool Bureau Inc.

The second in the bureau's series of "Wool Science and Technology Reports," the brochure discusses the application, efficacy and durability of the Dieldrin durable-mothproofing process, which it describes as ideal from the standpoint of cost and other factors.

Describing the durability of the new process as used against carpet beetles, the brochure says dyed and undyed wool fabrics containing Dieldrin were free from signs of larvae feeding after 20

washings, 25 drycleanings, 25 steam pressings, five drycleanings plus wet-cleanings, five sea water saturations, five acid or alkaline perspiration saturations, and after exposure for 100 hours in a Fade-Ometer.

It is claimed that millions of pounds of wool have been mothproofed with Dieldrin since 1953 in Australia where the process was developed. In that country, the report says in discussing the subject of toxicity, there have been no cases of Dieldrin poisoning either dermal or oral to dyehouse workmen, mill hands or consumers who have been using the treated wool products for five years.

Over 30,000,000 pounds of wool reportedly have been mothproofed with Dieldrin in the United States since the introduction of the process this past spring. A product of the Shell Chemical Corp, Dieldrin is being marketed by different companies under the names of Drewclad, Larvatex, Mothsnub, Duronized, Wooldrin, and Titamoth.

FRANCOLOR LITERATURE—*Francolor Inc, Division of Compagnie Francaise des Matieres Colorantes, Rhode Island Hospital Trust Bldg, Woonsocket, RI*———The following new technical literature is now available from Francolor:

Technical Leaflet No 247-E, covering Naphtazol 4J, for use in the dyeing of cotton and viscose rayon;

Technical Leaflet No 221-E, covering Naphtazol OP, also for use in the dyeing of cotton and viscose rayon;

Brochure No. 75/E, covering Heliane Scarlet J2N, a homogeneous vat color which is said to give extremely bright and very fast shades of scarlet;

Technical Leaflet No 238-E, covering Solasol Brilliant Orange RS, a solubilized vat color for the dyeing and printing of cellulosic fibers and natural silk; and

Technical Leaflet No 250-E, covering Inochrome Navy Blue RBL, for the dyeing of wool.

FRL SERVICES — *Fabric Research Laboratories, Inc, 1000 Providence Highway, Dedham, Mass*———Fabric Research Laboratories, Inc, research and development consultants in fibrous, organic, and related materials, has announced the publication of four pamphlets descriptive of certain services it performs.

Titles are: "Textile Electronics" (describing the unique demands of electronic innovations in the textile industry), "Fiber Identification Service" (identification and quantitative analysis of specialty and fur fibers, wool, vegetable fibers, man-made fibers, and blends), "Patent and Legal Services", and the "FRL Partial Unit Plan" (a research program specifically designed for the needs of small- and medium-size businesses).

HANDBOOK OF CHEMISTRY AND PHYSICS, 40th EDITION—*Literature available from Book Dept, The Chemical Rubber Co, 2310 Superior Ave, Cleveland 14 O*———This new, 3300-page handbook contains five indexed sections. It is the only complete reference for chemistry, physics, and mathematics of its kind that is continuously revised and published annually. More than 100 pages of new and revised scientific facts have been added.

Contents include:

Electron Physics Table

Physical Constants of the Rare Earth Compounds.

Superconducting Transition Temperatures

Magnetic Threshold Fields at Absolute Zero

Electronic Constants and Debye Temperatures for Superconducting Elements

Thermodynamic Properties of the Elements

Thermodynamic Properties of the Oxides

Physical Constants of Inorganic Hydrides

Chelating Agents

Ion Exchange Resins

Thermal Conductivity of Oven-Dry Wood Across the Grain

Thermal Conductivity of Wood Across the Grain at Various Moisture Content Values

Langevin Functions

Over 200 prominent authorities in all fields of science have collaborated under the guidance of Charles D Hodgman, editor-in-chief from Case Institute of Technology.

The Chemical Rubber Co, national distributor of laboratory supplies and equipment, also is publisher of the 11th Edition "CRC Standard Mathematical Tables" and 10th Edition "Pocket Size Mathematical Tables".

Free literature on all publications will be sent by the Company upon request.

HIGH-SPEED DIRECT-READING SINGLE-PAN BALANCES—*Fisher Scientific Co, 316 Fisher Bldg, Pittsburgh 19, Pa*———All of the single-pan balances in the Mettler line of Gram-atic® balances are described and illustrated in this bulletin, from a micro analytical balance with an accuracy of 0.002 miligram to a giant heavy-duty balance for remote-control weighings in atomic plants.

Included are the "general-purpose" Gram-atics, which are claimed to outperform all other balances of their type in regard to speed: in serial weighings, up to 30 weighings a minute.

A feature of the booklet is its simple explanation of the theory of single-pan substitution-type weighings in which a single beam, under constant load, eliminates lever error and provides constant sensitivity. *12 pages; illustrated.*

HOOKER CHEMICALS — *Hooker Chemical Corp, 2600 Forty-seventh St, Niagara Falls, NY*———This new 12-page catalog includes five chemicals which have been made available recently for general sale on a commercial scale. These products are Special Alkali 928, antimony pentachloride, HET® acid, methylchoromethyl ether, and trichlorophenol. A description, chemical formula, physical data, uses, and types of shipping containers are detailed for each of the 65 Hooker chemicals listed in this Bulletin 100-B.

IGEPON SURFACTANTS — *Antara Chemicals, 435 Hudson St, New York 14, NY*———This 16-page booklet on the properties and uses of Antara's Igepon series of anionic surfactants describes the chemical derivation of Igepon and gives the chemical formula, functional properties and uses of each of the brands.

IT PAYS TO KNOW THESE FACTS ABOUT VAT DYES—*Dyes Dept, American Cyanamid Co, Bound Brook, NJ*———This booklet endeavors to tell why vat dyes are the best buy in colored and printed fabrics. Written for retailers and sales personnel, the brochure specifies the types of merchandise that should be dyed or printed with vat dyes and tells the retailer or salesman how he can obtain vat dyes in merchandise he buys or sells.

Specifically, answers are given to such questions as: How fast is "colorfast"? What are vat dyes? How do vat dyes withstand the wash tub, sun, salt water, perspiration, laundry agents, and abrasion? How are vat dyes tested by Cyanamid?

LIST OF U S TECHNICAL PAPERS PRESENTED AT SECOND UNITED NATIONS INTERNATIONAL CONFERENCE ON THE PEACEFUL USES OF ATOMIC ENERGY—*25¢; Office of Technical Services, U S Dept of Commerce, Washington 25, DC*———The more than 600 U S papers offered at the Conference, held in Geneva, Switzerland, Sept 1-13, cover diverse research areas including those in chemistry and chemical engineering and technological application of isotopes and other radiation sources.

MCA MANUAL SHEET CA-1—*20¢; Manufacturing Chemists' Assoc, 1625 Eye St, NW, Washington 6, DC*———This manual contains almost 300 newly recommended abbreviations for the reagent and fine chemicals field. The abbreviations are intended primarily for mechanical data processing systems in which text space is limited and not for more technical or scientific applications.

Publication of the recommended standards is the result of study begun by an MCA task group at the request of member firms.

A combination of phonetics, chemical symbols and common trade usage was employed to formulate the abbreviations. For example, "sulf" becomes "SF"; "chlor" becomes "CL", and "ate", "AT". Thus, sulfate is "SEAT" and chlorate, "CLAT".

In a number of instances, however, common usage has been retained. This includes such well-known abbreviations as "SOD" for sodium and "MER" for mercury.

There is no official or semi-official requirement for use of the new abbreviations, but the MCA hopes that uniform standards will be established through general use of the new terms.

MECHANISM OF COTTON DETERGENCY—*Oronite Chemical Co, 200 Bush St, San Francisco 20, Calif*———A technical analysis of the factors involved in cotton detergency is presented in this new 16-page booklet, which evaluates each detergency factor and includes a detailed discussion of soils, the soil-fabric complex and the role of surfactants and builders in the cleaning process.

Illustrated with several diagrams and sketches, the booklet was prepared by R D Stayner, detergent specialist for Oronite.

MODERN LABORATORY APPLIANCES—*Harry M Schwalb, News Bureau, Fisher Scientific Co, 717 Forbes Ave, Pittsburgh 19, Pa*———This 1040-page Fisher Catalog 59, which has 528 more items than ever before, has been enlarged in every department. It contains a complete lab furniture catalog plus thousands of items of instrumentation, appliances, glassware and supplies along with reference tables in a new, slim-back edition.

Fisher plans to bring out new editions every two years in the future.

MOUNT HOPE AUTOMATIC TENSION CONTROL—*Mount Hope Machinery Co, 15 Fifth St, Taunton, Mass*——— The Mount Hope Automatic Tension Control is described as "a fool-proof device that maintains constant tension in web leaving the unwinding roll, regulates it through other processing, and controls tension web running to the winder." Just how this is achieved is told in this bulletin, which states that it is truly automatic and practically maintenance-free.

NOMOGRAPHY — *Interscience Publishers, Inc, New York, NY; price not specified*———This book, written by L Ivan Epstein, assistant professor in the department of physics and mathematics at Lowell Technological Institute, is said to interpret the subject fully.

A nomograph is a graphical device for representing a formula. It consists of scales representing the variables and is read with the aid of a straight edge laid across the scales.

NOPCONE LV — *Textile Chemicals Div, Nopco Chemical Co, 60 Park Place, Newark, NJ*———Nopcone LV is an antistatic coning oil which is said to be effective on all synthetic yarns. The product is a light-colored lubricant with nonyellowing and low frictional (fiber-to-fiber and fiber-to-metal) properties.

As a lubricant that reduces abrasion, Nopcone LV is said to be recommended by Owens-Corning Fiberglas Corp for use on polyvinyl chloride-coated Fiberglas. As an easily scoured coning oil, it is also said to be approved for use on Joseph Bancroft's Textralized yarns.

NOPCOSULF DATA BULLETIN—*Textile Chemicals Dept, Nopco Chemical Co, 60 Park Place, Newark, NJ*———New textile uses for the sulfonated oils known as Nopcosulfs have been compiled. As aids for processing cotton, wool, and rayon, the Nopcosulfs act as softeners, penetrants, wetting agents, and dye assistants.

They are said to improve such operations as the compressive shrinking, desizing, and finishing of cotton piece goods and the scouring of rayon and wool. They also serve as dye levellers, plasticizers for starch, and emulsifiers for textile lubricants.

POLYCO-BRAND POLYVINYL ACETATE EMULSIONS, SOLUTIONS AND DISPERSIONS—*Polyco-Monomer Dept, Borden Chemical Co, 350 Madison Ave, New York 17, NY*———Seven new data sheets have been published by Borden's covering the following products:

Polyco 345, a compounded vinyl acetate homopolymer dispersion.

Polyco 346-LV, a polyvinyl acetate solution in methanol, used as a surface coating and saturant.

Polyco 350W, a butadiene-styrene latex compatible with caseins, proteins, and starches.

Polyco 497, an alkali-soluble vinyl acetate copolymer emulsion, used in the formulation of textile and paper coatings and sizings.

Polyco 514W, a vinyl acetate homopolymer solution in acetone, used in surface coatings and saturants.

Polyco 684, a dextrine-compatible polyvinyl acetate emulsion; dry dextrine can be "cooked" directly into the emulsion by heating to 80° C.

EGD Monomer, ethylene glycol dimethacrylate, used as a cross-linking agent and as a momomer for copolymerization.

PRESSURE DYEING MACHINES FOR ALL TEMPERATURES — *The Longclose Engineering Co Ltd, Crescent Works, Dewsbury Rd, Leeds 11, England*———Catalog PM. 528 offers twenty pages of descriptive material, illustrations and data on the Company's line of machinery for dyeing all types of natural and man-made fibers in all forms.

Of special interest are the sections dealing with the quick-acting pressure cover, the pilot high-temperature sample dyeing machine, and the high-pressure recirculatory rapid dryer.

QUALITY CONTROL APPLICATIONS FOR BECKMAN SPECTROPHOTOMETERS — *Beckman/Scientific and Process Instruments Div, Fullerton, Calif*———Application Data Sheet DK-78-MI describes a technique for using Beckman DU, B, and DK spectrophotometers to obtain data for precise calculation of tristimulus color values, for the purpose of assuring more accurate color control and specification of dyes and other related colored products.

Application Data Sheet DK-87-B emphasizes the role of the DK Ratio-Recording Spectrophotometer in improving quality control, speeding analyses of complex formulations and increasing the accuracy of control methods.

QUILON CHROME COMPLEX — *Grasselli Chemicals Dept, D-4012A, E I duPont de Nemours & Co, Inc, Wilmington 98, Del*———Quilon chrome complexy reportedly is gaining broad acceptance in the textile industry in both Europe and the United States.

It is reported that an 80 to 90 spray rating (AATCC) can be obtained on wool, 90 rating on rayon and nylon, and a 100 rating on Dacron polyester fiber and Orlon acrylic fiber by treating the fabric with Quilon. The water repellency provided is said to have excellent permanency when drycleaned, and its hydrophobic properties are reported to strongly resist wicking and water spotting by sensitive dyes.

These, plus other applications in the textile field, are covered.

SILICONE ANTIFOAMS — *Hodag Chemical Corp, 7247 N Central Park, Chicago 45, Ill*———The brochure describes the chemical properties of silicone antifoams and outlines the nature of foaming systems. Information on Hodag Silicone Antifoams, including selection of the proper antifoam, specific physical and chemical properties of each type, applications, prices, and other similar data is covered in detail.

The brochure also gives information on Hodag's field engineering service.

SOAP AND DETERGENT BUYING, 1958 EDITION — *Associated Products Dept, Colgate-Palmolive Co, 300 Park Ave, New York 22, NY*———For each of the more than 40 products listed, this pocket-size Buying Guide contains information on the various uses for which it is best suited, special properties and complete details as to sizes, weights and packaging.

SOAPS AND SYNDETS—*$3 per copy on a yearly subscription; PockeTech Publishing Co, Box 4127, Washington 15, DC*———This new quarterly publication, the first copy of which was mailed in October, covers an important vertical segment of the chemical industry, is concerned solely with soaps and synthetic detergents. Each issue will contain U S Patent abstracts on the subject matter as reproduced from the U S Patent Gazette—there are 198 in the first issue—statistical data on soaps and syndets, and technical articles. The article in the initial October issue is "Today's Soaps and Detergents," and was written especially for *Soaps and Syndets* by Foster Dee Snell and Cornelia T Snell.

SPECS ON FATTY NITROGEN DERIVATIVES — *General Mills' Chemical Div, Kankakee, Ill*———Complete specifications on the five groups of fatty nitrogen derivatives produced by the Division are contained in this newly released literature.

The unique characteristics of these cationic chemicals are said to make them beneficial as textile conditioners. Fabrics treated with these softeners are said to be soft and fluffy, to dry faster, and to iron more easily.

STANDARD TECHNIQUES FOR pH MEASUREMENTS WITH TROUBLESOME SAMPLES — *Beckman/Scientific and Process Instruments Div, Beckman Instruments, Inc, 2500 Fullerton Rd, Calif* ———Techniques for making accurate pH measurements in usually troublesome samples such as soils, emulsions, suspensions and oils are covered in Application Data Sheet pH-85-MI.

Proper care of pH electrodes is discussed and step-by-step procedures are detailed for pH measurements in dry, porous samples, oils and other water-insoluble liquids, slurries, sludges, and viscous, colloidal and highly concentrated samples. Three separate procedures are outlined for proper soil pH measurements.

SUPERLOSE AND RAMALIN—NEW PRODUCTS BULLETIN—1958—*Starch Development Dept, Stein, Hall & Co, Inc, 285 Madison Ave, New York 17, NY* ———New and detailed information on these amylose and amylopectin fractions of starch in this 16-page revision of a previous 12-page edition. Principal expansions are the sections on preparation of solutions by hot and cold methods as well as the formation of films from these solutions.

THE CHEMICAL RESISTANCE OF ASTONIZED FINISH ON SYNTHETIC FABRICS—*Onyx Oil & Chemical Co, Jersey City 2, NJ*———The bulletin describes various tests made in the Oynx laboratories using the company's Astonized finish on samples of nylon, Dacron, Orlon and Dynel. Complete technical data concerning the test results are included.

Expected applications for the Astonized chemical-resistant finish are on laboratory coats, uniforms, work suits and other apparel used in occupations where chemicals and flammable solvents present a hazard. The antistatic properties of this finish also are said to enable man-made fabrics to provide greater wearing comfort.

THE PENFORD GUMS—*Penick and Ford, Ltd, Inc, 750 Third Ave, New York 17, NY*———Directed to the textile and paper industries, the text of this revised catalog is both technical and descriptive with information provided on the characteristics, properties and many uses of the various gums.

Under the section "The Use of Penford Gums in the Textile Industry", specific applications in warp sizing, textile printing, textile finishing, and cord polishing and thread glazing are covered.

THE SUPER AMIDES—*Onyx Oil & Chemical Co, Jersey City, NJ*———This six-page data file, which begins with the statement "The Super Amides represent the greatest advance in alkanolamide detergents in 25 years," covers Onyx Super Amides L-9, B-5, GR, and GC. It provides information in these categories: 1) suggested uses, 2) advantages, 3) chemical and physical characteristics, 4) typical performance, and 5) suggested formulations.

THIODIGLYCOL — *Union Carbide Chemicals Co, 30 East 42nd St, New York 17, NY*———Thiodiglycol, $HOCH_2$-$CH_2SCH_2CH_2OH$, marketed under the trade mark Kromfax, is the subject of this new and revised bulletin.

Kromfax solvent is a nonvolatile, water-soluble, chemically neutral liquid which is said to have high solvent power for vat, basic, and acid dyestuffs. It reportedly can be used to prepare superior printing pastes from vat dyestuffs, having higher color intensity than pastes prepared using alcohol or glycerol. With a wide variety of dyestuffs, mixtures having exceptionally high color values result when using Kromfax solvent, it is claimed.

Physical and physiological properties, specifications and test methods, and storage and shipping data are covered in the new bulletin.

THIS IS A FAMILY MATTER—*Cold Spring Industries, Inc, Empire State Bldg, 350 Fifth Ave, New York 1, NY*———This 4-page folder tells how to productively use Cold Spring's "Dela" series of finishing tags on finished goods and on garments.

The literature identifies each of the Company's finishing tags now offered and details the conditions affecting their use.

VINOL CWS—*Colton Chemical Co, 1747 Chester Ave, Cleveland 14, O*——Vinol CWS is a polyvinyl alcohol, which can be dissolved in water.

The new bulletin summarizes the results obtained in sizing Dacron/cotton yarn on the Calloway slasher and subsequent weaving tests conducted with the sized yarn. The BOD of the alcohol is said to be one-fifth that of starch. An additional potential advantage is the possibility that Vinol CWS may be reclaimed in the desizing operation and recycled.

As we look back on the year about to close, we're deeply grateful for the loyalty of old friends and proud, too, that many new friends have been added to our list. At this Holiday time it's a pleasure to express to you sincere appreciation and extend cordial greetings of the Christmas Season with warm wishes for the New Year.

American Dyestuff Reporter